IMPERIAL BUREAU OF ANIMAL HEALTH

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## DISEASES CAUSED BY BACTERIA AND FUNGI.

GWATKIN, R., HADWEN, S., & LE GARD, H. M. (1936). **Staphylococcic Infections of the Bovine Udder.**—*Canad. publ. Hlth J.* **27.** 391-400. 2 figs., 4 tables. [16 refs.]

The authors examined 260 cows, of which 143 were affected with clinical mastitis. Streptococci were found in 94 cases and staphylococci in 30 cases; in the remainder the causal organisms were not determined in every case. 20 of the 30 cases of staphylococcal mastitis occurred in 2 herds where no other pathogen was found. The udders were swollen or indurated and the milk abnormal in many instances; only 2 cases were severe, 1 proving fatal.

Mannitol was used to distinguish *Staph. pyogenes* from *Staph. epidermidis*. Of 80 strains tested only 41 produced a toxin and only 3 of these were lethal for g. pigs. No relationship was observed between toxin production and clinical severity. Attention is drawn to the possible public health importance of staphylococcal mastitis.—C. A. MITCHELL.

MEGYASZAI, G. (1936). Ujabb adatok a saponinos lépfenevakcinával való védőojtáshoz. [**Experiments with Saponin Vaccine against Anthrax**].—*Állatorv. Közl.* **33.** 4-7.

It is stated that saponin anthrax vaccine protects cattle, sheep and horses. Horses react most strongly. Sheep are best vaccinated in the base of the tail. A second injection given three months later does not increase the immunity. —Z. DE CZUKAS (MAGYARÓVÁR).

I. RITTER, H., & NOTHDURFT, G. (1936). Studien über die bovine Tuberkelbazillenkultur aus Lungenschleim tuberkulöser Rinder. [**Studies of Cultures of Tubercle Bacilli from the Lung Mucus of Tuberculous Cattle**].—*Zlb. Bakt. I. (Orig.).* **138.** 84-92. 1 table.

II. SCHUMANN. (1937). Die Entnahme der Gebärmutterschleimproben zum Zwecke des Tuberkelbazillen- Nachweises. [**The Removal of Uterine Mucus for Examination for Tubercle Bacilli**].—*Dtsch. tierärztl. Wschr.* **45.** 94-95. [1 ref.]

III. KAMPIK, H. (1935). Kann durch Perkussion der Intercostalräume mit einem

Spezialplessimeter zur Diagnose der Lungentuberkulose des Rindes beigetragen werden ? [**Diagnosis of Lung Tuberculosis in Cattle by Intercostal Percussion**].—*Inaug. Diss., Berlin.* pp. 42. 1 fig. [Numerous refs.]

I. When culturing bovine bronchial mucus for the diagnosis of pulmonary tuberculosis, the most troublesome contaminant encountered is a sporulating aerobe of the *Bacillus subtilis* type. This organism resists the action of 15% sulphuric acid for as long as 15 minutes. By allowing 5% hydrochloric acid to act for 3 to 24 hours the vitality of this contaminant can be reduced to a level at which it ceases to interfere with the development of tubercle bacilli, but such a procedure does not injure the mycobacteria. When bronchial mucus samples were treated with 5% hydrochloric acid for long periods, cultivation became a practical method of diagnosis. Thus out of 100 samples of bronchial mucus proved to contain acid-fast bacteria by microscopic means, 98 were positive by culture.

II. During the examination of over 100,000 bovines as many as 2,271 swabs from the uterine mucosa were taken for examination for tuberculosis, and of these about 9% proved positive (48% of bronchial mucus and 9% of milk samples proved to be positive in the course of the same investigation). The specimens of mucus were taken with a specially designed swab catheter, the cervix uteri being held open by a special dilator.

III. Percussion, using Schöttler's intercostal pleximeter, is of value for the clinical diagnosis of certain cases of pulmonary tuberculosis.—E. J. PULLINGER.

RAUTMANN, H. (1936). Tuberkulose-Statistik, -Entschädigung, -Fehldiagnose, -Infektionsmodus und -Ansteckungswege sowie Massnahmen zur restlosen Tilgung der Seuche. [**Statistics from Bovine Tuberculosis Control Work (Saxony)**].—*Dtsch. tierärztl. Wschr.* **44.** 607-614 and 624-629. 3 figs., 16 tables. [8 refs.]

R. presents figures for the number of open cases of tuberculosis diagnosed in the province of Saxony in the years 1934 and 1935. Of 15,892 samples taken for microscopic or biological diagnosis in 1934, 4,021 proved infected, and of 15,975 in 1935, positive results were obtained with 4,772. The relative frequency of infection of the lungs, udder, uterus and intestine were 90 : 6 : 2 : 0·08. Figures are given for the incidence of tubercle bacilli in bulked farm milk and it is apparent that the greater the number of cows in the herd the greater the chance of infection.

The tuberculin test was applied in 143 herds comprising 2,352 cattle and 71% of the cows and bulls reacted, 46% of the yearling cattle and 20% of the calves. R. stresses the importance in an eradication campaign of rearing young cattle in isolation, and of reconstruction of premises, and mentions the success attending this policy in three herds.

Details are given of *post-mortem* findings in tuberculous calves aged less than four weeks. In 173 calves examined in 1934, tuberculous lesions were found in the liver of 158, in the lungs or bronchial glands of 150, and in the mesenteric glands of 39 ; in 177 calves examined in 1935, the corresponding figures were 175, 153 and 43. The origin of infection in the liver is thought to be congenital with early spread to the lung. In support of this view R. found a case of tuberculosis of the liver and lungs in the foetus of one cow whose uterus was found to be affected. On account of the low incidence of lesions in the intestine it is thought that this route forms an infrequent mode of infection and that lesions in this site are more likely to be secondary.

The relationship of infection in the peritoneum and in the uterus in adults is discussed. The origin of infection in the uterus is thought to be from the peritoneum rather than by generalization in the blood stream.—S. J. EDWARDS.

I. PRÖSCHOLDT, O. (1936). Die bei der praktischen Tilgung der Rindertuberkulose zu beachtenden Infektionswege und Infektionsgelegenheiten. [**Ways of Infection to be kept in mind while eradicating Bovine Tuberculosis**].—*Berl. tierärztl. Wschr.* **52.** 725-730.

II. ZELLER, H. (1936). Beitrag zur Diagnose der Rindertuberkulose. [**Diagnosis of Bovine Tuberculosis**].—*Ibid.* 789-791.

I. P. indicates the chief methods by which tuberculosis is communicated to young stock. He does not support the findings of NIEBERLE regarding the importance of congenital infection in calves. Of 223 calves under three weeks old, 196 were born of tuberculous dams and in only three of these were lesions found. The chief methods of infection in young stock are ingestion and inhalation. In 34 herds where 76% of the cows reacted to the tuberculin test but no case of infection of the udder was suspected, complete isolation of the calves and young stock was succeeded by a very low incidence of infection. On the other hand, P. found a high incidence of infection in young stock where these conditions were not present. For instance, in 43 herds in which 91% of the cows reacted to the tuberculin test, but in which tuberculosis of the udder was not present, 60% of 1,588 young stock gave positive reactions. An increasing incidence of infection was found according to age, *e.g.*, of 223 calves under three weeks old, 1·3% reacted; of 1,177 between two and six months old, 17% reacted, and of 1,784 between one and two years old, 38% reacted. P. condemns the practice of feeding to calves raw skim milk purchased from creameries.

II. Z. tested the value of the intradermal tuberculin test in animals which were condemned for slaughter due to the presence of open tuberculosis. The details of the technique are given and it is stated that an increase of 3 mm. was taken to signify a positive reaction, readings being taken at the 72nd hour. With three different brands of tuberculin used the results were practically the same, the test being confirmed *post mortem* in 96·8% of the cases examined. There did not appear to be a significant difference in the results obtained with the three reagents, namely RGA tuberculin, Dorset's tuberculin and a commercial product. On the other hand the Meinicke and C.F. tests with blood sera gave only moderate agreement.—S. J. EDWARDS.

I. KLIMMER, M. (1936). Zur Tilgung der Rindertuberkulose. [**Eradication of Bovine Tuberculosis**].—*Berl. tierärztl. Wschr.* **52.** 677-680, 693-696 and 709-712. [Numerous refs.]

II. TRAUTWEIN, K. (1936). Das Kulturverfahren bei Nachweis und Erforschung der Tuberkulose. [**Cultural Diagnosis in Tuberculosis**].—*Ibid.* 680-683. 3 tables.

I. The various plans for the eradication of tuberculosis are discussed. The principles of the methods adopted in America and of the Bang and Ostertag systems so well known to readers are fully explained. The method recommended by K. is fundamentally similar to that of Bang but, in addition, the cattle are inoculated with antiphymatol as a curative and prophylactic measure.

II. T. records the results of the cultural examination of samples for the presence of tubercle bacilli, using the method of Petragnani and Besredka. Of 11,701 samples examined, 2,478 (21%) proved positive; 2,279 were samples of lung mucus, 137 were milk samples and 62 were uterine discharges. The animals giving positive cultural results were slaughtered and tuberculosis was found in all except 18 cases. A comparison of the diagnostic value of biological and cultural tests was made with 1,109 samples. Of these 316 (28%) gave positive results to the biological test and 299 (27%) similar results to the cultural test. T. outlines

the advantages of the cultural test. The value of cultural examination of the blood was tested but the results were not satisfactory.—S. J. EDWARDS.

FERREIRA, J. (1936). Tuberculose aviaire au Portugal. Étude bactériologique de quelques cas. [**Avian Tuberculosis in Portugal**].—*Arch. Inst. bact. Cam. Pest.* **7.** 181-196. 4 figs. on 4 plates, 1 table. [10 refs.] [English, French and German summaries].

F. records an incidence of tuberculosis in 22 of 5,000 fowls (0·44%) killed for food purposes in Portugal. Work with nine strains of bacilli isolated from them is described. Great variation in growth occurred among them. The avian strain caused the Yersin type of tuberculosis in rabbits (intraven. inoc.) and a large local lesion in g. pigs (subcut. inoc.).—J. E.

BROWN, M. H. (1936). **The Incidence of the Bovine Bacillus in Lesions found in Man.**—*Canad. publ. Hlth J.* **27.** 88-89. 1 table. [3 refs.]

Adopting the usual criteria of extensive pulmonary tuberculosis with or without glandular and peritoneal involvement as evidence of infection with the bovine type of tubercle bacillus, B. autopsied rabbits injected with weighed amounts of pure cultures of 241 strains of tubercle bacilli. The strains were obtained from various lesions in man representing a cross-section of the urban and rural population of Ontario. The incidence of the bovine type of tubercle bacillus was low, *viz*, 3·32%. In no case was it isolated from any specimen coming from the respiratory system. The bovine type had its highest incidence in strains isolated from spinal fluid where it accounted for 4 out of 39 cases (10·2%).—C. A. MITCHELL.

DOMANSKY, F. (1936). Bronchopneumonie hříbat za přítomnosti corynebakteria equi.—[**Broncho-Pneumonia in Colts Associated with** *Corynebact. pseudo-tuberculosis*].—*Voj. zdravotn. Listy.* **12.** 298-303. [9 refs.] [English and French summaries].

*C.pseudo-t.* is regularly found in pneumonia of colts, very often in association with haemolytic streptococci. The conditions under which these organisms become pathogenic and cause pneumonia are not yet known. The commonly suspected predisposing conditions, climate, etc., are discussed.—E. PŘIBYL (BRNO).

CASSAMAGNAGHI, A. (1935). La linfoadenitis de los ovinos: etiología, vías de infección, profilaxis. [**Aetiology, Route of Infection and Prophylaxis of Caseous Lymphadenitis in Sheep**].—*12th int. vet. Congr. 1934.* **2.** 319-335. 1 table. [In Spanish: English, French and German summaries].

This disease has been known in Uruguay for more than 30 years, affecting lambs to the extent of 1% to 3% and older sheep up to 20%. *Corynebacterium ovis* was found in 98% of 250 abscesses but no enzootics of broncho-pneumonia, toxaemias or generalization of abscesses could be attributed to it. C. discusses polymorphism, cultural characters and filtrable forms and states that all the cultures studied were virulent and toxic. Infection was produced experimentally in sheep *via* wounds, scarifications, and the digestive tract and from intradermic injection, also through intact skin. On the grazing plains around the River Plate a very common species of *Stipa* (*S. tenuis* Phil.) called " flechilla " sheds its " seeds " in November and December, and these penetrate through the skin of sheep, causing abscesses or ecchymoses, and the frequency of these lesions causes the meat works practically to stop slaughter of sheep from about Nov. 15th to Jan. 31st, to avoid losses from condemnation of carcasses due to abscesses. If wounds of this nature

offered a source of infection the statistics of meat works do not bear it out, the months of heavy infection being June and July.

C. concludes that the use of bacterins has not conferred protection.

He recommends the isolation of animals with open lesions and the avoidance of docking and castration of those lambs destined for the meat works, or alternatively that these operations should be carried out under really good surgical conditions.

Ulcerative lymphangitis has never been observed in equines in Uruguay but an outbreak in llamas and alpacas was once noted in a zoological park [see also *V. B.* **4.** 414. for information on C.L. in Patagonia].—A. H. HUNTER.

MORETTI, B. (1934). Contributo sperimentale all'infezione brucellare nel toro. [**Brucella Infection in Bulls**].—*Nuova Vet.* **12.** 316-325. 10 figs., 2 tables.

In order to determine the susceptibility of bulls to *Br. abortus*, 15 healthy bulls were kept in a shed along with infected cows; certain of the bulls (group A) were not allowed to serve the cows, and the others (group B) were allowed to serve them. After some time it was found that nearly all the bulls reacted to the agglutination test, there being no difference in the infection rates of the two groups. Four group A bulls were then allowed to serve healthy cows, but in no case did they transmit the disease to the cows. It is concluded that, unless there are definite lesions in the reproductive organs, bulls kept under normal conditions are unlikely to spread the disease.

A further experiment was carried out to determine the time at which agglutinins first appear in the blood of bulls after experimental infection. When suspensions of the organism were injected intravenously, subcutaneously or into the epididymis or testicle of healthy bulls, it was found that an agglutination titre of 1 : 1,000 was obtained a few days after inoculation. It then oscillated widely at this stage, making it difficult for a diagnosis to be based on one test only, and then tended to become stabilized at 1 : 100.—J. A. NICHOLSON.

CREECH, G. T. (1936). **Brucella suis Infection of the Brain of Swine.**—*J. Amer. vet. med. Ass.* **89.** 584-589. 4 figs. [4 refs.]

A brief review of the anatomical regions from which the porcine type of *Brucella abortus* has been isolated in pigs, and a description of the macroscopic and microscopic lesions in a case of necrotic encephalitis due to this organism. In addition to the usual cellular reaction associated with brucella invasion, there was a marked accumulation of eosinophiles.—E. J. PULLINGER.

I. WIGHT, A. E. (1937). **Progress in the Federal-State Bang's Disease Program.**—*J. Amer. vet. med. Ass.* **90.** 268-273.

II. BROOKBANK, R. E. (1937). **Area Work in Bang's Disease Control.**—*Ibid.* 273-287. 4 tables.

III. MOSCRIP, W. S. (1937). **The Attitude of the Breeder and the Milk Producer toward the Control of Bang's Disease.**—*Ibid.* 287-292.

IV. MCKAY, K. G. (1937). **Experiences in the Control of Bang's Disease in California.**—*Ibid.* 292-301.

V. ANON. (1937). **Report of Committee on Bang's Disease. [U.S. Live Stock Sanit. Ass.]**—*Ibid.* 301-303.

I. The eradication programme on a voluntary basis continued, and at the end of October, 1936, the number of animals under supervision had increased to 6,450,000. Experimental work on vaccines continued but field experiments were limited to the vaccination of 2,400 calves.

II. The number of cattle tested in Virginia now amounts to 167,221, of which 2·3% were reactors. In the retest of 71,824 cattle there were 0·5% reactors.

Testing is now compulsory, but the efficacy of the programme is dependent on public opinion, which fortunately supports eradication as the only method of attacking the problem.

The scheme is carried out by taking a certain area at a time, and testing all the cattle in that area. There have been no disappointments and there does not appear to be any instance of infection spreading to cattle from any other species of animal; experience indicates, however, that it is necessary to retest infected herds at intervals of 30 days, or even less. Eradication is made easier by the smallness of the herds, which average four animals, many "herds" consisting of a single animal.

Replacements by animals negative to a single test are unsatisfactory, 3% being reactors when retested; animals from herds free from the disease are more satisfactory for this purpose.

III. The opinion is expressed that calves are more healthy in herds free from brucella infection, and that it is possible to keep both reacting and non-reacting cattle on the same premises if proper precautions are taken. A clean herd will soon be necessary for breeders who wish to sell at high prices, and the branding of reacting cattle is very desirable.

IV. An interesting report on an attempt to eradicate brucellosis of cattle in a district naturally separated from the surrounding districts and 85 miles from the nearest railway.

The method adopted was the segregation of animals reacting to the agglutination test, for which it was necessary to send the cooled blood samples 559 miles. The scheme was complicated by the introduction of a tuberculosis eradication scheme, which sometimes necessitated susceptible heifers being introduced into farms in which B.C.A. was enzootic.

The efforts to control the disease were not as successful as was anticipated, a result suggested as being in part due to the high rainfall in the district. Elsewhere in California, however, the results obtained in demonstration herds have been very satisfactory.

V. The committee recommend the continuance of the Federal-State programme, and advocate the testing of all antigens for uniformity, and the more frequent retests of herds, especially where there is a rising infection. Animals suitable for use as replacements were in some cases difficult to obtain and, where procurable, were more susceptible to infection than the animals already in the herd, so that precautions with regard to cleaning and disinfection were particularly necessary. More attention should be paid to the disinfection of utensils, such as pitchforks, used on infected premises, and in many states more adequate arrangements were necessary for dealing with reactors.

2,400 calves had been vaccinated but, while the experiment would be watched with great interest, it was regrettable that certain parties had become prematurely over-enthusiastic and had recommended the general use of vaccines.—H. H. H.

I. Delez, A. L. (1937). **Results of Administering Two Calfhood Injections of a Living Brucella abortus Culture to prevent Bang's Disease.**—*J. Amer. vet. med. Ass.* **90.** 61-65. 1 table. [4 refs.]

II. Keylock, H. E. (1936). **The Value of Vaccination with Live Culture of *Br. abortus* for the Prevention of Abortion.**—*J. comp. Path.* **49.** 350-359. 5 tables. [3 refs.]

III. Wilson, D. E., & Evans, S. A. (1936). **Results of Passage of Human and**

**Monkey Strains of *Brucella melitensis* through Pregnant Heifers.**—*Ibid.* 336-339. [6 refs.]

I. Eight out of 11 heifer calves received an injection (subcut.) of a 48-hour growth of a strain of *Br.a.* that had been cultivated for two years. A further dose was given six weeks later. All the calves were served when 12 to 14 months old, and at the fifth or sixth month of pregnancy were exposed to infection from a recently isolated bovine strain of *Br.a.*, given by the mouth.

All the vaccinated heifers had a normal pregnancy, but two calves died. *Br.a.* was recovered from the uterus and/or udder of five of these heifers.

Of the three controls, two aborted, and *Br.a.* was recovered similarly from all three. The opsonic index varied irregularly in the two groups.

II. An attempt is made to draw conclusions from an uncontrolled experiment as to the protection conferred on cattle by inoculation with a live *Br.a.* vaccine. Records of a herd consisting of about 300 cows, among which brucellosis was enzootic, show that in comparison with former years the number of full-term calves was increased by 6·32%, abortions were decreased by 4·32%, and retention of the placenta was decreased by 2·59%.

Sterility, deaths and disposals of unprofitable cows appeared to decrease. In heifers, however, abortion and sterility were increased. The value of the vaccine did not appear to be high and its use is not being continued. Figures for the third year in which the vaccine was used are not yet available.

III. A strain of brucella, obtained from a typical case of undulant fever in man, typed as *Br. melitensis* was used to infect a monkey. The organism was recovered true to type from the monkey and was used to infect a pregnant heifer.

The heifer and all the adult animals in the same herd were negative (aggl. test) for *Br.a.* Following the application of a culture of the organism to the conjunctiva, the heifer showed a gradual rise of temperature, lasting for five weeks, when she calved at full term.

The calf died during a difficult parturition and the organism isolated from the stomach was typed as *Br.a.* Four attempts to repeat this apparent mutation were negative.—H. H. Holman.

Hagan, W. A. (1937). **The Animal Reservoirs of Brucellosis.**—*Cornell Vet.* **27.** 14-20. [Numerous refs.] [Also appeared in *J. Bact.* **33.** 39-40].

A short review of the susceptibility of domesticated animals to brucellosis. Three forms of infection are postulated. Firstly, where the organism passes from the alimentary canal to its associated lymph nodes, and here usually succumbs. Secondly, where the organism becomes localized as an abscess and may be liberated with the release of pus. Thirdly, where the organism has a predilection for the genital organs, and is liberated in quantity during parturition, or may be excreted in the milk.—H. H. Holman.

Pergher, G., & Noel, G. (1936). Note sur la fièvre ondulante au Ruanda-Urundi. [**Undulant Fever at Ruanda-Urundi, Belgian Congo**].—*Ann. Soc. belge Méd. trop.* **16.** 217-222. 3 graphs. [3 refs.]

P. and N. observed four cases of rather benign U. F. in male Congo natives, all of whom owned cattle. Brucella cultures, which behaved like a smooth and a rough strain of *Br. abortus* respectively, were isolated from two of the men. The cattle of the four men were examined and agglutinins were present in the blood of cattle of two of the men, from one of whom cultures had been grown. The other man from whom a culture was obtained had evidently not become infected

from his own cattle. P. and N. believe that U. F. is wide-spread in the Belgian Congo.—J. E.

SIMITCH, T. V., & DJOURICHITCH, M. (1936). La maladie de Bang en Yougoslavie chez l'homme. [**Human *Br. abortus* Infection in Yugoslavia**].—*Ann. Inst. Pasteur.* **56.** 620-633. 5 tables. [15 refs.]

S. and D. examined 1,481 blood samples of persons in or around Belgrade and found brucella agglutinins in 21 persons who were all farm workers. They were all healthy and had not had fever of the undulant type.—J. E.

HENRICSSON, E. (1936). Om abortbacillens hållbarhet i vatten. [**Viability of *Brucella abortus* in Water**].—*Skand. VetTidskr.* **26.** 57-61. 3 tables. [4 refs.] [English summary].

In previous work [(1932). "Epizootischer Abortus und Undulantfieber". Stockholm: Marcus.] H. stated his opinion that brucellosis can spread in water. He now proves that brucella can survive at various temperatures in sea-water and in water infected by *Bact. coli*.—H. BERTHELSEN (STOCKHOLM).

VAN ROOYEN, C. E. (1936). **The Biology, Pathogenesis and Classification of *Streptobacillus moniliformis*.**—*J. Path. Bact.* **43.** 455-472. 14 figs. on 3 plates, 1 table. [Numerous refs.]

Further experiments have been made with *Streptobac. moniliformis*, an organism producing lesions in mice resembling ectromelia [*V. B.* **4.** 212].

The organism has been compared with strains isolated by LEVADITI and with similar bacteria obtained by other workers. The morphological appearances and growth characteristics of the bacillus are described in detail.—R. E. GLOVER.

ANON. (1936). **The Effect of Vibrion septique Toxin on Animals.**—*Publ. Hlth Rep., Wash.* **51.** 1459-1460. [1 ref.]

The toxin of *Clostridium septique* is almost unique in the rapidity with which it produces death in laboratory animals. It would appear to have an affinity for the heart, in which degeneration of groups of muscle fibres occurs. Zenker's necrosis is produced in practically all cases, and it is suggested that it is the actual cause of death. Changes are also produced in the kidneys, colloid degeneration and necrosis of the tubules, with thrombosis of the glomeruli being found. —A. WILSON TAYLOR.

KOUCHAKOFF, P. (1937). **The Intestinal Flora and its Role in the Life of Man and the Higher Animals.**—*Lancet.* **232.** 425.

Observations in the arctic regions have shown that the intestinal flora of polar animals becomes progressively poorer as the North Pole is approached. It is concluded that in some animals the entire process of digestion and assimilation can take place without the intervention of bacteria.

The author's experiments have shown that an increase in the number of leucocytes after each meal does not take place after the consumption of untreated food but only after the ingestion of food altered by high temperatures and complicated manufacture. In order to determine the true significance of the intestinal flora and its role in the digestive processes it is, therefore, considered desirable to carry out experiments on animals fed on a diet which causes no changes in the leucocyte formula of the blood.—F. BLAKEMORE.

## DISEASES CAUSED BY PROTOZOAN PARASITES.

PERUZZI, M. (1935). Polimorfismo e trasformazioni globulari di alcuni tripanosomi africani nei loro rapporti con la patologia. [**Polymorphism of Certain African Trypanosomes in Regard to their Pathology**].—*Pathologica.* **27.** 577-586. 3 text figs., 24 figs. on 2 plates. [14 refs.] [English and German summaries].

P. studied the variations of *Tryp. brucei* in an attempt to determine the relationship between its morphology and pathogenicity.

The typical form appears as a long, slender, easily stained organism with an elongated nucleus and rapid movements. This form is responsible for the invasion of the host and does not induce phagocytosis. Variations in the morphology of the organism first appear at the time of division, when changes may be seen in the nucleus. In some individuals there is asymmetric division and abnormal forms make their appearance in the blood stream, tissues and serous exudates. They are usually spherical in shape and show sluggish movements and an ill-defined nucleus. They are capable of further division but their appearance indicates that the strain is undergoing degeneration and will soon die. They are produced in large numbers after the rapid passage of a strain through susceptible animals and always induce an increased phagocytosis.—J. A. NICHOLSON.

POČEČUEV, K. N. (1935). Materiali po zabolevaemosti lejšmaniozom sobak v Aščhabade po dannin podvornovo pogolovnovo obsledovanija. [**The Incidence of Canine Leishmaniasis in Ashkabad**].—*Med. Parasitol., Moscow.* **4.** 112-116. 1 table. [2 refs.]

P. examined 3,385 dogs in Ashkabad and found leishmaniasis in 97 (2·86%). Pure cultures of leishmania were obtained from many of those affected with the cutaneous form. The disease disappeared spontaneously in seven dogs kept under observation for two years.

STABLEFORTH, A. W., SCORGIE, N. J., & GOULD, G. N. (1937). **Trichomonas Disease of Cattle.**—*Vet. Rec.* **49.** 211-224 and 248-256. 4 figs. on 1 plate. [Numerous refs.]

The first part of this paper reviews the literature on the subject of the infection of the sexual organs of cattle with *Trichomonas foetus*, the detection of the parasite, its morphological and cultural characteristics, and its relationship to the disease of cattle associated with endometritis, pyometra and abortion in the first few months of pregnancy. The authors consider that there is considerable evidence to support the belief that *T.f.* is the cause of the disease, but that the findings of KÜST, that trichomonads can be cultivated from the blood of unserved cattle, if confirmed, throw some doubt on this belief, and that some other factor, *e.g.* a pre-existing catarrh, may enable the trichomonads to multiply in the genitalia.

Outbreaks of the disease have been recorded from three counties in England, and a detailed description is given of the investigations into one of these outbreaks. Clinically the disease was characterized either by abortion in the early stages or by a condition simulating false pregnancy with an enlargement and marked tenseness of the uterus. In the latter case, a careful examination of the ovaries *per rectum* failed to reveal the presence of a palpable corpus luteum. Three bulls were involved in the outbreak; all had served diseased cows which subsequently proved to be infected with trichomonads, but 19 out of 23 animals involved in the outbreak were definitely in-calf to one or other of them. Treatment consisted in dividing the herd into normal and infected sections and in supplying new bulls for the

healthy females. For treatment of affected cows, uterine irrigation was carried out with a watery solution of iodine, " metaphen " and 1% to 3% solution of lactic acid, the last two giving good results. A note is appended recording the findings on the histological examination of a single case by WHITE, and a note on human vaginal trichomonad infection by KNOWLTON is also included. It is pointed out that, in both the human and bovine infections, the normal acidity of the vaginal transudate is replaced by an alkalinity with a pH 7·5 to 8·5.—U. F. R.

BENESCH, F., & WURST, R. (1936). Bericht über einen schweren Trichomonadenbefall bei Rindern auf einem Gutshof in Niederösterreich. [**A Serious Outbreak of Trichomonas Infection in Cattle in Austria**].—*Wien. tierärztl. Mschr.* **23.** 481-487.

In view of the circumstances under which a serious outbreak of trichomonas disease occurred in lower Austria, B. and W. suggest that a hitherto unrecognized form may exist which is resistant to environmental influences and may be responsible for apparently new outbreaks of the disease.—A. W. STABLEFORTH.

MÉSZÁROS, I. (1936). Adatok a trichomonas-abortus előfordulásához. [**Trichomonad Abortion in Cattle in Hungary**].—*Állatorv. Lapok.* **59.** 128-130. 1 fig. [9 refs.]

Trichomonads have frequently been found in cattle slaughtered for meat in Hungary, being present in 40% of all cases of pyometra examined by M.
—Z. DE CZUKAS (MAGYARÓVÁR).

I. RIEDMÜLLER, L. (1936). Beitrag zum kulturellen Verhalten von Trichomonas foetus. [**Cultural Behaviour of** *T.f.*].—*Zlb. Bakt. I.* (*Orig.*). **137.** 428-433. 3 tables. [7 refs.]

II. MUSSILL, J. (1937). Untersuchungen über die Widerstandsfähigkeit der Rinder-Trichomonaden gegen physikalische und chemische Einflüsse. [**Resistance of Bovine Trichomonads to Physical and Chemical Influences**]. —*Wien. tierärztl. Mschr.* **24.** 104-109. [4 refs.]

III. SACHWEH. (1937). Ueber die Trichomonadenseuche. [**Trichomonad Disease**].—*Dtsch. tierräztl. Wschr.* **45.** 119-121.

IV. EICKMANN, H. (1937). Die Bekämpfung der Trichomonaden-Infektion beim Rinde in der Rheinprovinz. [**Control of Trichomonad Infection in Cattle in the Rhine Province**].—*Ibid.* 121-123. [2 refs.]

I. *T. f.* in pure culture grows readily in peptone broth to which the serum of the horse, mule, ox or sheep has been added. With a serum concentration of 10%, subculture must be carried out every 3 to 4 days, though the trichomonads live 4 to 5 days. With higher serum concentration the flagellates live rather longer, and in pure serum they will survive 4 to 8 days. Previous heating of the serum-broth to 70° to 90°C. does not destroy the suitability of the medium. The addition of blood gives little advantage over serum, and washed blood corpuscles added to broth did not render the medium more suitable for trichomonad cultivation. Trichomonads multiplied over a range of acidity between pH 5·5 to 8·0. For the maintenance of cultures 1% agar at pH 7·4 to which 10% serum has been added is recommended. Evaporation must be prevented by covering with paraffin. The medium is inoculated by the stab method, growth occurring along the track of the needle, and survival being most prolonged in the depth of the tube. Subculture can be delayed up to 3 or 4 weeks.

The addition of 1% to 3% glucose favoured growth in serum broth. The influence of various sugars on growth was investigated, and it appeared that various

hexoses, disaccharides and polysaccharides favoured growth, the best results being obtained in those media in which most acid formation occurred. A heavier growth was obtained under anaerobic conditions, and the organism is considered to be a facultative anaerobe.

II. M. found that *T.f.* resists freezing to −14°C. but is susceptible to heat, and is destroyed at 49°C. The organism is resistant to alterations in osmotic pressure, and will survive at a salt concentration of between 0·42 to 2%. It survives between pH 5·5 and 8·5 but is killed by greater alkalinity. It is rather resistant to arsenicals and antimonials, and is not rapidly destroyed by a 2% watery solution of iodine, 0·2% potassium permanganate, 1% boric acid or 1% " entozon ". " Chloramin", 2% sodium perborate or 1% soda are recommended for disinfection ; the perborate, being less irritant to mucous membranes, is recommended for irrigation, and the soda for the disinfection of stalls.

III. S. records observations on bovine trichomonad infection in Westphalia, and points out that the disease is confined to the highlands. He considers that when the vaginal secretion becomes alkaline owing to vaginitis or other causes it becomes a suitable medium for the trichomonad which may be introduced by coitus. He considers that only healthy bulls and cows should be used for breeding, and that animals suffering from vaginitis should be excluded. He also suggests that malnutrition, bad housing, bad management and particularly lack of Ca may be the most important factors in trichomonad infection.

IV. E. discusses bovine trichomonad infection in the Rhine province, and special regulations for its control. He points out that a bull keeper may demand a veterinary certificate of health before he allows the service of a cow from any herd in which he suspects disease to exist. The method of control adopted has been the examination of all animals in infected herds and, in any animals in which vaginal discharge is detected, a careful examination of the uterus. He points out that cases of pyometra may not exhibit vaginal discharge and thus escape examination.

He asks that all veterinary surgeons should report on the value of control methods as it is particularly important to ascertain whether treatment of bulls is satisfactory, and also to ascertain the cause of the recurrence of disease after it has been apparently eradicated.—U. F. Richardson.

Davidson, J. A., Thompson, W. T., & Moore, J. M. (1936). **Some Observations on the Presence in Laying Pullets of the Parasite causing Coccidiosis in Young Chickens.**—*Quart. Bull. Mich. agric. Exp. Sta.* **18.** 178-182. 5 tables.

A number of Rhode Island pullets were divided into " negative " and " positive " groups according to absence or presence of organisms in caecal droppings. [We should like to know what precautions were taken to ensure the absence of oocysts as they are frequently overlooked in small infections]. The birds of both groups were housed and fed in the same way. The results of observations showed 121% increase in mortality of positive over negative ; on a hen-day basis egg production was 15·2 eggs per bird higher in the negative group. There was a difference in weight of 0·44 lb. in favour of negative birds. [This is a preliminary report and there is nothing unexpected in the results].—C. Horton-Smith.

I. Patriat. (1936). La piroplasmose du cheval en Côte-d'Or. [**Equine Piroplasmosis in the Cote-d'Or**].—*Bull. Soc. Sci. vét. Lyon.* **39.** 237-239.

II. Girardot, M. (1936). La piroplasmose du cheval en Côte-d'Or. [**Equine Piroplasmosis in the Cote-d'Or**].—*Ibid.* 240-247.

I. A brief note on the matter dealt with in II.

II. G. observed in three years over 150 cases of a puzzling disease in horses in the country near Dijon. The animals showed high fever, anorexia, tucked-up abdomen and general malaise. The disease had come to be regarded as infectious anaemia or a type of influenza and, as jaundice was but seldom seen, piroplasmosis was not suspected.

" Gonacrine " was tried empirically and gave very good results; repeated blood tests were, therefore, carried out and after a time piroplasms [species not given], were observed in blood smears. The same disease has also been recorded in the Haute-Marne, l'Ain, la Loire and Saône-et-Loire departments in France. —J. E.

Rossi, P. (1936). La piroplasmose équine vraie. Observations cliniques, hématologiques et thérapeutiques. [**Equine Piroplasmosis**].—*Rev. Microbiol., Paris.* **2.** 173-188. [Numerous refs.]

R. gives an account of his studies of *Babesia caballi* infection in horses as met with in the department of Saône-et-Loire, France. The article is in four sections, namely, epidemiology, symptomatology, haematology and treatment. That devoted to haematology is the most extensive and comprises an investigation of the various blood changes met with and the recognized analytical and diagnostic blood tests. Under the heading " treatment ", novarsenobenzol and " gonacrine " alone are dealt with, the latter being the author's drug of choice. Although this article adds little to existing knowledge of this disease, it constitutes an excellent record of its present incidence and method of treatment in France.—C. Davenport.

I. Kolomietz, J. S., & Pilipenko, M. K. (1936). Die Pferdenuttalliose im Süden der Ukraine. [**Equine Nuttallia Infection in Ukraine**].—*Tierärztl. Rdsch.*, **42.** 692-694.

II. Yakimoff, W. L., & Todorsky, F. A. (1936). Zur Frage über die Piroplasmose und Nuttalliose der Pferde. [**Piroplasmosis and Nuttalliosis of Horses**].—*Münch. tierärztl. Wschr.* **87.** 483-484.

III. Zolotareff, N. A. (1936). Zur Frage der intrauterinen Infektion der Haustiere mit Piroplasmose. [**Congenital Piroplasmosis in the Calf and Foal**].—*Tierärztl. Rdsch.* **42.** 306-308.

IV. Yakimoff, W. L., & Todorsky, F. A. (1936). Die Babesiellose der Rinder im Gebiet Gorki (früher Nischni-Nowgorod). [**Babesiasis of Cattle in the Gorki Region (Russia)**].—*Ibid.* 937.

I. *B. equi* infection is spreading seriously in Ukraine where the incidence is greatest between June and August. Mixed infections with *B. caballi* and *B. equi* are often seen. In S. Ukraine the incidence is associated with the spread of the tick *Hyalomma marginatum.*

II. Report of the identification of *B. equi* infection and a brief sketch of the differential diagnosis from *B. caballi. B. equi* infection does not respond to trypan blue injections but may be controlled with " protargol ".

III. *B. bigemina* infection was diagnosed in a 5-day old calf, parasites being readily found within the erythrocytes. In view of the recognized incubation period of this parasite following inoculation, it is thought that intra-uterine infection must have occurred. This idea is confirmed by the finding of *B. equi* and *B. caballi* infection in a stillborn foal.

IV. Report of cases of haemoglobinuria due to *B. bovis.*—E. J. Pullinger.

Galuzo, I. G., & Bespalov, V. M. (1935). Gornie vipasi kak metod profilaktiki piroplasmozov krupnovo rogatogo skota v uslovijach gissarskoj dolini.

[**Use of Mountain Pastures as a Prophylactic Measure against Piroplasmosis of Cattle in the Valley of Hissar**].—*Trud. Tadzik. Bazi Akad. Nauk, SSSR.* **5.** 199-204. 2 maps. [1 ref.]

G. and B. accompanied part of a herd of cattle to summer pastures, over 6,000 feet above sea level, in the mountains of Tadzikistan. A part of the herd (cows about to calve, stud bulls and lame and sick cows), was left behind in the valleys and served as a control. It was found that, with the exception of some cows – which might have already been affected when they started since they fell ill within the incubation period – there were no cases of piroplasmosis among the cattle transferred to the mountain pastures. 65% of the controls developed the disease. G. and B. attribute the immunity of the cattle taken to the higher altitude to the fact that neither *Boophilus annulatus*, vector of *Babesia bigemina* and *Françaiella colchica*, nor *Hyalomma detritum rubrum*, vector of *Theileria annulata*, occurs on the higher pastures. The ticks which do exist on these higher pastures (*Dermacentor silvarum*, *H. marginatum* and *H. aequipunctatum*) are not biologically fitted to be vectors of piroplasmosis.

Purvis, G. B. (1937). **The Control of East Coast Fever in Africa, with Some Remarks on Colonial Office Policy.**—*Vet. Rec.* **49.** 119-122. [Num. refs.]

P. discusses the validity of theilerial species affecting cattle, and points out that it is now admitted that *Theileria parva* is inoculable with blood containing blue bodies, that blue bodies occur in *Th. mutans* infection, and that the only satisfactory proof of the distinct nature of theilerial species must be immunological. He also discusses the solidity of the immunity in East Coast fever, the significance of relapses and the reinforcement of immunity by reinfection. He points out that the calf mortality in enzootic areas may vary between 5% and 70%, and that this variation in mortality is believed to be mainly due to the method of management. He does not advocate dipping in enzootic areas as the reduction in the number of ticks may interfere with the production of immunity, and allow a dangerous situation to arise in which the cattle will contract infection at a period of greater susceptibility. He deplores the policy of cattle conservation in areas where it may lead to overstocking.—U. F. Richardson.

Goyanes, J. (1936). Aspects morphologiques de *Bartonella canis*. [**Morphology of *Bartonella canis***].—*Ann. Parasit. hum. comp.* **14.** 423-428. 1 fig., 1 table. [7 refs.]

Splenectomized dogs were examined from the haematological point of view. Repeated examinations were made to study the effect of splenectomy on the gastric secretion, and the subsequent effect of splenic extract on the secretions of such dogs. In one case death was caused by an infection of *Bartonella* ; in another by a mixed infection of *Bartonella* and piroplasms. In most cases bartonella organisms were localized in the centre of the red blood corpuscles. Seven cases revealed quantities of red blood corpuscles parasitized by isolated or multiple coccoid-like forms. G. believes that the ring-like phases described by Reichenow and Regendanz [(1932). *Arch. Schiffs- u. Tropenhyg.* **36.** 305.] have an early stage in which the filamentous, granular forms appear to possess zones similar to undulating membranes. These extensions form the " violin-box " described by Kikuth [(1928). *Klin. Wschr.* **7.** 1729]. Coccoid-like forms are produced by fragmentation of filaments.—C. Horton-Smith.

Kouwenaar, W., & Wolff, J. W. (1934). Onderzoekingen over Sumatraansche rickettsiosen. VI. Een rickettsiose uit varkensteken. [**Investigations of**

**Sumatran Rickettsiases. VI. A Rickettsiasis from Ticks from Wild Pigs**]. —*Geneesk. Tijdschr. Ned.-Ind.* **74.** 1659-1670. 3 figs. on 1 plate, 3 tables. [14 refs.] [English summary].

It is probable that Sumatran human mite fever and scrub typhus can be transmitted by ticks as well as by mites. An illness with the characteristics of rickettsiasis was set up in g. pigs, rabbits and a macacus monkey, using suspensions of ticks of various kinds (*Dermacentor auratus*, *Rhipicephalus haemaphysaloides* and *Haemaphysalis papuanae*) which were found on wild pigs.

This rickettsiasis differs in its pathology from Sumatran mite fever and scrub typhus. The blood serum of all wild pigs, which had harboured ticks from which rickettsia infective material was obtained, gave a positive Weil-Felix reaction against *Proteus* OX (Kingsbury strain), but not against the OX19 strain.

—M. J. J. Houthuis (Rotterdam).

Wirth, D. (1937). Infektionsversuche mit Leptospiren. [**Infection Experiments with Leptospira**].—*Wien. tierärztl. Mschr.* **24.** 97-104. 4 figs. [Num. refs.]

W. reports further work on Stuttgart disease and leptospirosis. He has found that leptospira are commonly excreted in the urine and may be present in dogs showing practically no ill-health ; they are best seen by dark-field examination of urine sediment. The blood urea is raised in leptospiral Stuttgart disease and may exceed 500 mg. % in fatal cases (normal amount is 20-50 mg. %).

Urine from a chronic case of leptospirosis was injected subcut. into 2 puppies and gave rise to a leptospiruria of some 38 days' duration, without loss of health. Fatal leptospiral jaundice was set up in puppies by subcut. or peroral infection with kidney suspension from canal rats.

Attempts to pass the disease from these puppies to adult dogs failed. Some of the puppies died after an incubation period of from 5 to 12 days and 1 to 2 days' illness, and others after a chronic course of 35 days.

59 out of 166 canal rats from Vienna were found to have leptospira in their kidneys, but the latter organs only showed very slight inflammation. Leptospira were also found in house mice and field mice. Cats were examined with negative results (there was one doubtful case depending on the interpretation of a kidney section).

Cats have resisted artificial infection with kidney suspension from infected dogs and rats, but one cat was infected with a rat leptospira culture (1 c.c. subcut.) without becoming ill, the organism being recovered from kidneys and urine 27 days later.

The work of others on species of leptospira infecting dogs is also referred to [*V. B.* **7.** 68 and 171].—J. E.

## DISEASES CAUSED BY VIRUSES.

Rahim-ud-Din, M. (1936). **Rinderpest Immunisation at Livestock Station Hosur Cattle Farm.**—*Indian vet. J.* **13.** 128-130.

Fourteen cattle were immunized against rinderpest by the serum-virus method, 190 by goat virus and 89 by serum alone, and the reactions were noted : they were somewhat slighter in the goat-virus group. Eight cattle showed serum sickness with urticaria after receiving serum.—R. L. L. Hart.

Schmidt, S. (1936). Fortsatte undersøgelser over aktiv immunisering af marsvin mod mund- og klovesyge. [**Active Immunization against Foot and Mouth**

**Disease**].—*Maanedsskr. Dyrlaeg.* **48.** 337-353. 5 tables. [6 refs.] [French summary].

In continuation of earlier work [*V. B.* **7.** 421.] S. now demonstrates the vital importance of the virulence of virus used for the immunization of g. pigs by means of $Al(OH)_3$ vaccine. When virus adsorbed to $Al(OH)_3$ is inoculated (subcut.) the virus remains localized at the site of injection and in seven hours it is rendered non-pathogenic. If the material inoculated is withdrawn before 14 days and injected into another animal it still possesses a strong immunizing power.

*In vitro* the virus in an $Al(OH)_3$ vaccine is rendered non-pathogenic in from 24 to 48 hours at a temperature of 37°C., but it still possesses a high immunizing power. It appears that the combination of virus serum + $Al(OH)_3$ heated for 2 hours at 37°C. is more effective than virus + vesicle fluid + $Al(OH)_3$ heated for 48 hours at the same temperature.—H. C. Bendixen (Copenhagen).

I. Lignières, R. (1935). Vaccination antiaphteuse chez les bovines. [**Vaccination against Foot and Mouth Disease**].—*C. R. Acad. Agric. Fr.* **21.** 884-888. [1 ref.] [Also appeared in *Rev. zootec.* **22.** 84-86].

II. Schmidt, S., & Hansen, A. (1936). Immunisation active du cobaye contre la fièvre aphteuse au moyen du virus actif combiné avec l'hydroxyde d'aluminium. [**Active Immunization of G. Pigs against F. & M. by Virus with Aluminium Hydroxide**].—*Acta path. microbiol. scand.* **13.** 405-423. 2 tables. [11 refs.] [In French].

I. A group of seven bovines was inoculated with small doses of Lignières' immune polyvalent serum and vaccine both subcutaneously and intradermally. Two animals received three injections at 10-day intervals, and five received two injections. The controls were three uninoculated animals, one of which had recovered from a previous infection with the virus. After vaccination the animals were infected with a small dose of unmodified virus intradermally and also by scarification of the buccal mucosa. All the vaccinated animals resisted the infection whilst the control animals showed typical lesions, with the exception of the recovered bovine. Similar results are reported to have been obtained in g. pigs. L. suggests that the second dose of vaccine and serum might be used as a simplification of the previous method of three doses.

II. A high proportion of aluminium hydroxide to active virus is required for the production of a vaccine which can be inoculated subcutaneously without the appearance of clinical symptoms. A strong immunity is produced in a short time; this immunity is as pronounced as that obtained by the use of a formolized vaccine.

The virus is rapidly absorbed by aluminium hydroxide, provided that it is diluted with distilled water or saline. It cannot be recovered by the use of Martin's broth or of fresh g. pig serum. A small quantity may be liberated from the aluminium-virus complex by the use of saline phosphate (pH 7·6). Virus in combination with aluminium hydroxide is destroyed after 24 hours when inoculated subcutaneously into the g. pig.—E. C. Hulse.

Waldmann, O. (1935). Experimentelle Untersuchungen zur aktiven Immunisierung gegen Maul- und Klauenseuche. [**Active Immunization against Foot and Mouth Disease**].—*Z. InfektKr. Haustiere.* **47.** 283-322. 18 tables. [Numerous refs.]

W. describes the results of many years' work on unsuccessful attempts to produce a method of active immunization against F. & M. disease. Using g. pig virus either fluid in lymph or blood, or dried, no useful vaccine was obtained, and

passage failed to diminish the virulence of the virus. No immunity followed the inoculation of cattle with from 0·5 to 1 litre of serum from carrier animals.

Simultaneous inoculation of bovines with virus and antiserum often failed to produce any immunity to subsequent artificial infection, nor was it possible to produce any appreciable immunity with virus prepared in tissue culture.—E. J. P.

I. Levaditi, C., Païc, M., Krassnoff, D., & Voot, J. (1936). Ultrafiltration et dimensions probables des virus de la fièvre aphteuse et de la stomatite vésiculeuse. [**Ultrafiltration and Probable Dimensions of the Viruses of Foot and Mouth Disease and Vesicular Stomatitis**].—*C. R. Soc. Biol. Paris.* **122.** 619-621. 1 graph. [9 refs.]

II. Galloway, I. A., & Elford, W. J. (1936). **Purified Foot-and-Mouth Disease Virus. I. Studies on Some of its Physical Properties.**—*Brit. J. exp. Path.* **17.** 187-203. 2 figs., 10 tables. [19 refs.]

I. A brief résumé is given of previous experimental work. It is shown that the end-point of ultrafiltration of the F. & M. virus is about ten times smaller than that of vesicular stomatitis. The size of the F. & M. virus is calculated to be 0·003$\mu$ to 0·005$\mu$, and that of vesicular stomatitis 0·06$\mu$ to 0·09$\mu$. This difference in size is probably correct, provided that the experimental conditions are identical when ultrafiltration is performed.

II. Purified preparations of F. & M. virus in buffered phosphate solution at pH 7·6 have been made by repeated washing on collodion membranes. A negative reaction is given to the sulphosalicylic acid protein test, and the preparations are found to be as potent as the stock filtrates. The stability of the purified virus is found to be comparable with that of the unpurified virus after three days at 22°C. or after one month at 0°C.

Purified virus is relatively unstable in a digest broth medium, and more sensitive to the photodynamic action of methylene blue ; it is more susceptible to the lethal action of alcohol. On filtration in buffered phosphate solution, the purified virus behaves in a similar manner to the unpurified virus. At the critical pH values of 8·6 and 7·6, two zones of relative stability are found as in the unpurified virus. When dried *in vacuo* the purified virus is infective for at least a week at −4°C. to 0°C.—E. C. Hulse.

Fletcher, J. M., & Galloway, I. A. (1937). **Louping-Ill in the Horse.**—*Vet. Rec.* **49.** 17-18.

A case of suspected " louping ill " in a horse is described. The animal, which was located in a " louping ill " district, was affected with a febrile condition associated with peculiar nervous symptoms.

Samples of serum from this animal, and from another which had been in contact, were examined by G., who found that both contained considerable amounts of neutralizing antibodies to " louping ill " virus. Control samples from horses in districts free from " louping ill " entirely failed to neutralize the virus.

G. discusses the results obtained with sera from human beings, monkeys, sheep and cattle and suggests that sufficient evidence has been adduced to show that bovine and equine animals can be infected with the virus possibly in an " inapparent " form and thus serve as reservoirs of virus for sheep.—R. E. Glover.

Grysez, V. (1937). Action de certaines températures sur la conservation de l'activité du virus fixe de Pasteur. [**Viability of Rabies Virus at Certain Temperatures**].—*Ann. Inst. Pasteur.* **58.** 125-129. 1 table. [1 ref.]

A series of dried spinal cords from infected rabbits, preserved in glycerin, was

incubated at −10°, +4°, and +23°C. respectively from 1 to 24 days. The virus was found to retain completely its activity at the above temperatures up to the eighth day. From the 8th to the 24th days, the diminution in activity was approximately proportional to the increase in the storage temperature. The cords preserved at 23°C. were completely avirulent after the 17th day. The use of these cords preserved at different temperatures is recommended for the prophylactic treatment of rabies in man.—E. C. Hulse.

Hoyt, A., Fisk, R. T., Moore, F. L., & Tracy, R. L. (1936). **Experimental Rabies in White Mice II. Studies on Passive Immunization.**—*J. infect. Dis.* **59.** 152-158. 5 tables. [9 refs.]

A report upon experiments on white mice to determine the efficacy of passive immunization against fixed rabies virus, using rabbits and goats for the production of the antisera.

Following the intraperitoneal injection of large doses of antiserum made shortly before the intracerebral inoculation of virus, 36% of the treated mice survived against 9% of the controls. A longer incubation period was shown in each group of treated mice that contracted rabies than by the corresponding controls. Antiserum injected 16 days before or shortly after the virus failed to protect infected mice. Treatment with normal sera or serum prepared against normal rabbit brain was ineffective.

The intracerebral injection of antiserum half an hour before intracerebral virus inoculation afforded excellent protection, whilst antiserum injected either 24 hours before or 2 hours after virus was ineffective.

The injection of antiserum intraperitoneally, at periods of 4 days or less before intramuscular inoculation of virus gave excellent protection, whilst only slight protection was given when antiserum was administered one day after the virus. —K. D. Downham.

Remlinger, P., & Bailly, J. (1937). Action de la dilution sur les virus rabiques de rue. [**Action of Dilution on Street Rabies Virus**].—*C. R. Soc. Biol. Paris.* **124.** 7-9. [1 ref.]

A brief summary of experiments on the effect of the dilution of street rabies virus. Eleven strains were studied in Morocco and conflicting results were obtained. The titre was found to vary between 1 : 2,000 and 1 : 100,000. This variation is explained by the difference in virulence of the different sources of the virus. Dilution of the street virus is more of theoretical interest than of practical importance : in nature undiluted virus operates.—E. C. Hulse.

Alves de Souza, M., & de Abreu Martins, I. (1937). Heartwater no Lazareto-quarentenario do Ministerio da Agricultura no Rio de Janeiro. [**Heartwater at Rio de Janeiro Quarantine**].—*Folha vet., Brazil.* **2.** 1-2. [English summary]. [Also appeared in *Bol. Soc. brasil. Med. vet.* **6.** 6-8].

Inoculation of defibrinated blood from Persian sheep, and Angora and Nubian goats, imported from South Africa, into kids, Brazilian goats, sheep and cattle, proved that imported goats were carriers of heartwater virus.—S. Torres.

Braga, A. (1936). Observaçoes a pesquizas em torno da peste suina no Brasil. [**Swine Fever in Brazil**].—*Rev. Dep. nac. Prod. anim.* **3.** 17-98. 23 figs. on 16 plates, 3 tables. [Numerous refs.] [English and French summaries].

The existence of S.F. in Brazil has been proved experimentally by cross-immunity tests with American and Algerian S.F. viruses. The Brazilian virus is

of apparently low potency and it was difficult to produce S.F. in test animals. Brazilian pigs affected with S.F. often showed swine plague and worm infestation.
—S. Torres.

Shope, R. E. (1936). **Immunization Experiments with Swine Influenza Virus.** —*J. exp. Med.* **64.** 47-61. 3 tables. [11 refs.]

These experiments were performed to determine the effect of the dosage, the route of administration, and the source from which the virus was obtained, upon the efficacy of swine influenza virus in the immunization of swine, ferrets and mice. Swine were immunized by the intramuscular or subcutaneous inoculation of swine influenza virus obtained from the lungs of infected ferrets and mice. Ferrets were found to be immune to intranasal infection with the virus after having received a subcutaneous injection of virulent ferret lung material. Mice were immunized to intranasal infection by the injection (subcut.) of virus from the lungs of infected mice, but not to the injection of virus from the lungs of ferrets and swine. Intraperitoneal inoculation of ferrets and mice immunized them to intranasal infection.

In two field experiments attempts to confer immunity on pigs failed: the inoculation transmitted the disease.—E. C. Hulse.

Smith, W., & Stuart-Harris, C. H. (1936). **Influenza Infection of Man from the Ferret.**—*Lancet.* **231.** 121-123. 1 table, 1 graph. [8 refs.]

While handling experimental ferrets infected with a passage strain of human influenza virus, one of the workers contracted the infection. The incubation period was approximately 48 hours and typical symptoms of influenza were shown. Since influenza was not generally prevalent at the time, it was concluded that the infection had been contracted from the ferret. The examination of nose and throat washings from the human patient indicated that the virus was identical with the passage strain infecting the ferrets.—E. C. Hulse.

Beaudette, F. R., & Hudson, C. B. (1937). **Cultivation of the Virus of Infectious Bronchitis.**—*J. Amer. vet. med. Ass.* **90.** 51-60. 2 tables. [5 refs.]

The infectious bronchitis referred to here is a disease, affecting young chicks about nine days old, which causes some loss as a result of death, but a still greater loss due to interference with growth.

This condition was reproduced by the inoculation, intratracheally or intranasally, of filtered exudate and the virus was cultivated on the foetal membrane of 12-day-old eggs. Inoculation of the culture also resulted in reproduction of the disease.

The virus is shown to be distinct from that of infectious laryngotracheitis.
—W. J. Ironside.

Green, R. G., & Shillinger, J. E. (1936). **A Virus Disease of Owls.**—*Amer. J. Path.* **12.** 405-410. 5 figs. on 1 plate. [2 refs.]

A suspension of liver and muscle from a great horned owl (*Bubo virginianus*) which was found dead, was transmitted to experimental owls and caused their death in about a week. The disease in both natural and experimental cases was characterized by abscess formation or necrosis in the liver and occasionally in other organs. On the grounds of the presence of numerous inclusion bodies, it is claimed that the disease is caused by a filtrable virus.

[No experiments with filtered material were undertaken].— R. E. Glover.

THOMPSON, Juanita. (1936). **Spontaneous Virus Diseases in Common Laboratory Animals (Mice, Rats, Cats and Monkeys).**—*Arch. Path.* **21.** 531-540. [Numerous refs.]

T. reviews the literature on spontaneous virus diseases and related conditions in laboratory animals, and includes her own observations during a five-year period. Five groups of diseases are described, those caused by :–

(1) Filtrable agents which produce cell inclusions and are transmissible (infectious ectromelia and hepatapathy of mice ; virus B and herpes of monkeys).

(2) Filtrable agents which cause cell inclusions, but are not transmissible (disease of salivary glands of mice and rats).

(3) Filtrable agents which do not cause cell inclusions (lymphatic choriomeningitis of mice and monkeys ; distemper of cats).

(4) Transmissible agents, the filtrability of which is not established and which do not cause cell inclusions (Theiler's disease – paraplegia in mice – and lymphatic leucaemia of mice).

(5) A mixed group of agents causing reactions similar to those produced by known viruses. This group is mentioned as a probable " reservoir " of some obscure human virus diseases.—C. V. WATKINS.

RIVERS, T. M. (1937). **Viruses and Koch's Postulates.**—*J. Bact.* **33.** 1-12. [2 refs.]

R. points out that while an acceptance of Koch's postulates was of great value in the early years of bacteriology, recent advances have shown that under certain circumstances they should be modified. Numerous examples of the false conclusions which may follow a rigid adherence to all his premises are cited, and particular attention is drawn to the claims which have been made that streptococci are the cause of poliomyelitis simply because they appear to fulfil the ordained conditions.

Modifications are particularly desirable in the case of virus diseases. R. suggests that the two important criteria are (a) a specific virus must be associated with the disease with regularity, and (b) the virus must be shown to occur in the affected individual as the cause of the disease and not as an accidental finding.

The pitfalls which have to be avoided in animal experiments with viruses, *e.g.*, virus III of the rabbit, latent vaccinia or herpes, etc., are noted, and several illustrations of mistakes which have arisen are given.—R. E. GLOVER.

## PARASITES IN RELATION TO DISEASE (HELMINTHS).

I. TAYLOR, E. L. (1937). **The Revelation of the Life-History of the Liver Fluke as an Illustration of the Process of Scientific Discovery.**—*Vet. Rec.* **49.** 53-58. 12 figs.

II. TAYLOR, E. L. (1937). **An Example of the Value of Morphology in Medico-Biological Investigation [Liver Fluke].**—*Proc. R. Soc. Med.* **30.** 238-244. 4 figs., 1 diagram.

I. An account of the history of the discovery of the life-cycle of the liver fluke, based mainly on the writings of Max BRAUN. First there is a brief description of the life-cycle as we now know it, then a short history of the discoveries of the various larval stages, and of the way in which these scattered fragments of information were at long last linked together to complete our knowledge of a remarkable sequence of events. The adult fluke was well-known prior to 1752 when SWAMMERDAM observed cercariae in a snail. At intervals during the next

hundred years other observers found the other stages, but it was not until 1882 that THOMAS and LEUCKERT, working independently, followed through the complete life-history. Included in the paper is an original diagrammatic presentation of the history of the discovery which enables the reader to comprehend at a glance the complicated whole.

II. T. uses the history of the discovery of the liver fluke life-cycle to illustrate the continuity of the process of scientific achievement as well as to show how the morphological outlook assists in connecting the units of knowledge collected by various observers.—C. HORTON-SMITH.

BARBIERI, G. (1935). Le alterazioni del midollo osseo nella distomatosi epatica delle pecore. [**Bone Marrow Changes in Liver Fluke Disease in Sheep**].—*Nuova Vet.* **13.** 257-261. 1 fig.

B. carried out experiments on the lesions found in the bone-marrow of sheep, some infested with *Fasciola hepatica* and some with *Dicrocoelium dendriticum*. He examined the marrow of ten badly infected sheep, and found moderate erythroblastic activity with notable granular formations of an eosinophilous type. There was proliferation of lymphoblastic elements and, rarely, the presence of active growing cells, with constant formation of megakaryocytes.—S. F. J. HODGMAN.

TETLEY, J. A. (1937). **Distribution of Nematodes in the Small Intestine of the Sheep.**—*N.Z. J. Sci. Tech.* **18.** 805-817. 5 figs. [4 refs.]

A description of the method of sampling from intestines of sheep obtained in abattoirs and round the Manawatu district.

The distribution in the intestines of healthy sheep of species of *Capillaria*, *Bunostomum*, *Cooperia*, *Nematodirus*, *Strongyloides* and *Trichostrongylus*, is shown by a graph. In a mixed infection each nematode species has its own peak position, so many feet from the pyloric valve.

The normal frequency distribution occurred in a number of species regardless of the time of day, season, age and starvation, etc., in which sampling occurred.

It was concluded that in normal sheep there was no significant migration from certain areas of the intestine, and that individual larvae select the area of infestation.—C. S. M. HOPKIRK.

TEIXEIRA DE FREITAS, J. F., & LINS DE ALMEIDA, J. (1936). Notas sobre " Strongyloides " das aves domesticas. [**Strongyloides of Domestic Fowls**].—*Rev. Dep. nac. Prod. anim.* **3.** 1-16. 12 figs. on 3 plates, 1 table. [15 refs.]

The authors describe and discuss at length the identity, morphology and life-history of *Strongyloides oswaldoi*, Travassos, 1930, and *S. avium* Cram, 1929. For the first time the male *S. oswaldoi* is described. Tests with gentian violet as a vermicide were begun.—S. TORRES.

DEL ROSARIO, F. (1936). **Dirofilaria immitis Leidy and its Culicine Intermediate Hosts in Manila. I.**—*Philipp. J. Sci.* **60.** 45-57. 2 figs. on 1 plate, 2 tables. [6 refs.]

The author lists 13 known vectors of *D. immitis*; to these he is able to add *Culex quinquefasciatus* Say, 72·4% of 149 individuals which had been fed on a known carrier proving, on dissection, to be carrying infection. *Stegomyia fasciata*, a known vector, was also used and 73·8% found to have become infected. Development in the mosquito was found to be completed in from 10 to 12 days, an observation which corresponds to what has been recorded by other workers.—E. L. TAYLOR.

## IMMUNITY.

Geurden, L. (1936). Vergelijkende tuberculineproeven bij het rund. [**Comparative Tests with Human, Bovine and Avian Tuberculins**].—*Vlaam. Diergeneesk. Tijdschr.* **5.** 177-181. 1 table. [3 refs.] [English, French and German summaries].

Comparative tuberculin tests were made on bovines and there was no difference in the reactions when either human or bovine tuberculin was used. Tuberculous bovines gave a slight reaction to avian tuberculin and a negative reaction to johnin, phleolin, mallein and glycerin-broth. With negative reactors no sensitivity seems to develop after repeated injection of tuberculin.

In tuberculous animals a positive reaction to the double intradermal test occurs when human or bovine tuberculin is used for the first injection and avian tuberculin is used for the second.—M. J. J. Houthuis (Rotterdam).

Campiglio, F. (1937). Titolazione dell " esotubercolina " mediante prove a reazioni locali e generali. L'intrapalpebro-reazione nella diagnosi della tubercolosi bovina. [**The Intradermo-Palpebral Exotuberculin Test**].—*Azione vet.* **6.** 65-68. 1 table. [2 refs.]

Using as the test dose 2 c.c. of 50%, 25% or 12·5% dilutions of exotuberculin in normal saline, satisfactory intrapalpebral reactions were obtained even with the lowest dilutions, on cattle known to be suffering from tuberculosis. The reaction as a rule reached its maximum between the 42nd and 68th hours. —J. A. Nicholson.

Klobouk, A. (1936). K otázce tuberkulinové allergie u aktinomykosy a brucellosy. [**Allergy to Tuberculin in Actinomycosis and Brucellosis**].—*Zvěrolék. Rozpravy.* **10.** 169-186 and 193-199. [13 refs.] [German summary].

Tuberculin testing (ophthalmic, intradermal and subcut.) of cattle with actinomycotic lesions of the head or lungs gave negative results. The same results were obtained in cattle, previously inoculated with massive doses of living *Br. abortus*. These results confirm the opinion that the allergy caused by tubercle bacilli is strongly specific.—E. Přibyl (Brno).

Saenz, A. (1936). Accroissement de l'état allergique conféré au cobaye par l'inoculation de bacilles paratuberculeux, morveux, de Malassez et Vignal et de *Brucella* morts, enrobés dans de l'huile de vaseline. [**Increase of Allergy in the Guinea Pig by Inoculations of Killed Cultures of** *Mycobact. paratuberculosis*, **the Glanders Bacillus,** *Pasteurella pseudotuberculosis* **and Brucella, Embedded in Vaseline**].—*C. R. Soc. Biol. Paris.* **122.** 911-915. [5 refs.]

Killed cultures of the different organisms used, embedded in vaseline, were inoculated into g. pigs. After a varying interval, the animals reacted strongly to an allergic test, *i.e.* to tuberculin, mallein, etc. The reaction was not obtained, or was much less marked, in control g. pigs inoculated with saline suspensions of the organisms, grown and killed in the same way.—A. Wilson Taylor.

Bordet, P. (1936). Contribution à l'étude de l'allergie. (Deuxième mémoire). [**Allergy. II**].—*Ann. Inst. Pasteur.* **57.** 357-399. 6 tables. [Numerous refs.] [See also *V. B.* **6.** 874].

B. describes attempts to reproduce sensitivity to a Shwartzman test by various agents other than bacterial products. Simple oedema caused by ligature of the

base of the ear in rabbits or by friction with toluol showed that sensitivity was due to more than interference with circulation. In some cases injection (intraderm.) of serum followed by peptone solution or milk products produced sensitivity. From experiments of this type, and after a study of the literature upon this type of sensitivity, B. concludes that inflammatory tissue, even in the absence of infection, predisposes to allergic intoxication, and that the marked fragility of the newly formed blood vessels may explain the haemorrhagic reactions to the test substances.

B. has shown that concentrated *Bact. coli* toxin injected (intraven.) may give rise to haemorrhagic reactions in healthy tissues, especially in the respiratory apparatus of rabbits. Sensitized bovine R.B.C.'s cannot cause a Shwartzman reaction in rabbits sensitized by *Bact. coli* toxin, but sensitized goat cells cause an intense reaction. B. thinks that the greater agglutinability of the latter may explain this finding. Solutions of agar and starch act in the same way as goat cells and B. recalls that both of these have the property of transforming serum into anaphylotoxin.

A few *in vitro* experiments show that humoral factors play little part in a Shwartzman reaction.

The histology of the Shwartzman reaction and the blood changes which occur after the test injection are described. B. found that a transitory, but very severe, leucopenia was produced and noticed masses of agglutinated leucocytes in his blood films. He suggests that these may block capillaries and so account for the haemorrhagic lesions. This agglutination could not be caused by *in vitro* methods.

He shows that *Bact. coli* toxin given intravenously after skin infection by *Bact. coli* or *Salmonella paratyphi* causes a lessening of the local reaction set up by the bacterial injection to a degree corresponding to the haemorrhagic zone produced by the toxin.

B. notes that non-specific allergy in tuberculous rabbits is very similar to the Shwartzman reaction. He produced in tuberculous g. pigs a haemorrhagic peritonitis by injection (intraven.) of tuberculin if they were prepared by injection (intraperit.) of talc six days previously, but no reaction in healthy g. pigs. He was unable to passage sensitivity to tuberculin and his attempts to increase the toxicity of tuberculin by the use of tuberculous sera were negative.

B. shows that the injection (intraderm.) of bacterial toxins and turpentine may influence the following serological tests in tuberculous animals. Vernes' flocculation reaction in sera by resorcinol is increased (this could not be repeated by *in vitro* methods), the rate of sedimentation of red blood cells is increased and the speed of gelification of sera by lactic acid is also increased. He explains that the marked Vernes' reaction in tuberculosis is caused by absorption of toxins at the sites of infection. He could find no correlation between a Vernes' reaction and a Shwartzman reaction. The increased Vernes' reaction caused by injection (intraderm.) of turpentine only occurred for a few days during the period of acute local inflammatory reaction. This injection also caused a non-specific immunity due to an increased activity of complement.—C. V. Watkins.

Larsson, G. (1936). Allergiska reaktioner vid kvickdrag hos häst. [**Allergic Reactions in " Broken Wind " (for Haymoulds)**].—*Svensk VetTidskr.* **41.** 408-410. 1 fig., 1 table.

Suspensions of spores were made from different moulds isolated from hay. The technique is not given. One species of *Aspergillus* caused a rather strong cutaneous reaction in 8 horses affected with broken wind, but 3 of 6 healthy horses also showed similar reactions [? latent allergy]. Further investigations should be carried out.—H. C. Bendixen (Copenhagen).

Wall, S. (1936-1937). Serologiska undersökningar av nötkreatur från landsdelar, som av ortsveterinären anses vara fria från sjukdomen smittsam kastning hos nötkreatur. [**Serological Tests on Herds Supposed to be Free from Bovine Brucellosis**].—*Skand. VetTidskr.* **26.** 678-695 and **27.** 1-10, 11-27 and 111-128. 3 figs., 2 maps. [English summary]. Reprinted in *Medd. Sällsk. vet.-med. Forsk.* No. 1. pp. 17 and *Medd. Stat. vet.-Bakt. Anst. Stockh.* No. 141. pp. 28]. [English summary].

W. investigated the incidence of non-specific agglutinins in cattle to *Brucella abortus* and has come to the conclusion that they do not occur. He is of the opinion that an agglutination value of 10 – using a notation he has described [*V. B.* **7.** 235.] – is a positive reaction.

He carried out serological tests in several herds (altogether 853 head of cattle) which he regarded as totally free from bovine brucellosis. In no cases did he obtain agglutination with amounts of sera corresponding to the figure 10 or less.

—H. Berthelsen (Stockholm).

Diernhofer, K. (1936). Eine Ballungsreaktion zum Nachweis banginfizierter Rinder. [**A Flocculation Test for Bovine Contagious Abortion**].—*Wien. tierärztl. Mschr.* **23.** 657-662. 3 figs., 1 table.

Two volumes (6 drops and 3 drops respectively) of the serum under test are, after inactivation, mixed on a slide with one drop of a special antigen and one drop of fresh defibrinated blood from a normal cow. The mixture is spread, and the presence or absence and degree of clumping with one or both volumes of serum is recorded after 40 minutes at room temperature. The antigen consists of a standardized mixture of boiled *Brucella abortus* and a bovine red cell agglutinating serum. The fresh defibrinated blood contains the red cells, and the complement in " sufficiently constant amount for all practical purposes". It is believed that the antibody involved differs from that of the agglutination reaction.

The results agreed closely with those of the author's tube aggl. method, but gave a much lower proportion of doubtful results, and a certain number of positive results in sera which were negative to the aggl. test. This is the more striking since the author's aggl. method is a sensitive one and his criteria severe. [*V. B.* **7.** 184].

—A. W. Stableforth.

I. Eickmann, H., & Eschbaum, T. (1937). Nachprüfung der Flockungsreaktion zum Nachweis des seuchenhaften Verkalbens nach Sachweh. [**Sachweh's Flocculation Test for Bovine Brucellosis**].—*Dtsch. tierärztl. Wschr.* **45.** 101-104. 7 tables. [5 refs.]

II. Pröscholdt, O. (1937). Die Klärungs- bzw. Flockungsreaktion zur Feststellung der Bang-Infektion des Rindes. [**The Clearing or Flocculation Reaction for Bovine Brucellosis**].—*Ibid.* 104-105. [5 refs.]

I. The Sachweh flocculation and the complement-fixation and agglutination tests were compared in testing over 2,000 blood samples. Whilst all tests agreed in a very large proportion of cases, the Sachweh test gave the fewest erroneous results and its adoption in control schemes is advocated.

II. When compared with the agglutination, complement-fixation, and M-K (Meinike-Klarung) tests in examining several thousand blood samples, the Sachweh test gave the fewest erroneous results and doubtful reactions. [It is not possible to judge how the Sachweh test would compare with the agglutination test were a more severe critical agglutinin titre adopted than is generally used in Germany].

—E. J. Pullinger.

KUJUMGIEFF, I. (1936). La formol-gelificazione nella sierodiagnosi dell-aborto infettivo delle cavalle. [**Diagnosis of Equine Abortion by the Formol-Gel Reaction**].—*Nuova Vet.* **14.** 14-17. 1 table.

From a comparison between the results obtained with the formol-gel reaction and the aggl. test, K. concludes that the former is of no value for the diagnosis of equine paratyphoid abortion.—J. A. NICHOLSON.

MARCIS, Á. (1936). Adatok a tenyészbénaság serodiagnostikájához. [**The Sero-Diagnosis of Dourine**].—*Állatorv. Lapok.* **59.** 139-142. 1 graph.

Complement-fixing antibodies develop rapidly in horses newly infected with dourine, and are already detectable in 10 to 12 days. In old cases the c.f. antibody content fluctuates so that for diagnostic purposes repeated tests are necessary. —Z. DE CZUKAS (MAGYARÓVÁR).

I. JAKOBKIEWICZ, J. (1936). Toxine et anatoxine botulique. [**Botulinus Toxin and Antitoxin**].—*C. R. Soc. Biol. Paris.* **123.** 262-264.

II. JAKOBKIEWICZ, J. (1936). Les antitoxines dans le sérum thérapeutique antibotulique. [**Antitoxin Content of Botulinus Antiserum**].—*Ibid.* 264-266. [1 ref.]

I. The toxin of a Type A strain and a B strain of *Clostridium botulinum*, received from America, possessed a M.L.D. for the g. pig of 0·00005 c.c. and 0·000005 c.c. respectively, when grown on an adaptation of Wrzoek's medium.

The best toxoid was prepared by the addition of 0·48% formalin, followed by incubation for six weeks.

II. An attempt was made to immunize five horses against *Cl.b.* Type A and Type B. The use of toxin appeared too dangerous, one horse dying. Following this a toxoid was used.

The horse giving the best serum received one g. pig M.L.D. as a first dose, and this was increased over a series of 32 injections to 750,000 M.L.D. The serum obtained varied in titre from 200 to 2,000 international units.—H. H. H.

STRONG, P. S. (1936). **The Nature of a Virucidal Substance in "Normal" Human Serum as Compared with the Trypanocidal and Bactericidal Substances.**—*J. Immunol.* **30.** 403-415. 6 tables. [Numerous refs.]

"Normal" human serum can manifest its virucidal activity against "W" virus [presumably herpetic] in the absence of all the known components of complement. The virucidal substance is partially inactivated at 64°C. and totally at 80°C. Heterologous antigens do not absorb the virucidal substance from human serum. No permanent union between virus and antibody takes place during two hours of contact, since the neutral mixture can be rendered infective by simple dilution. The virucidal substance is capable of producing a specific antibody when injected into rabbits.—J. M. ROBSON.

CASTANEDA, M. R. (1936). **Studies on the Mechanism of Immunity in Typhus Fever. I. Rickettsia Prowazeki in the Different Stages of the Typhus Lesion. II. Allergic and Toxic Reactions Produced with Rickettsia Prowazeki.**—*J. exp. Med.* **64.** 689-699 and 701-715. 8 figs. on 3 plates, 7 tables. [10 refs.]

The veterinary interest of these papers is that of general immunology particularly in relation to rickettsia infection.

I. C. shows that Mexican typhus virus produces local skin reaction after intradermal injection into g. pigs, and that rickettsia bodies are numerous in the

first few days in the skin lesion, especially in the walls of the capillaries. They diminish in proportion to the increase of polymorphonuclear infiltration and are rarely found in mononuclear phagocytic nodules, probably owing to previous destruction by the polymorphonuclears.

II. If typhus-immune g. pigs were treated as the above normal g. pigs, a similar lesion was produced, but the reaction appeared earlier and was more transitory. If the virus was heat-killed or formalin-killed, no significant reaction was obtained in immune g. pigs. Live virus could be recovered within 72 hours from the skin lesion of immune g. pigs after intradermal inoculation. Formolized Mexican virus produced a slight skin reaction in normal g. pigs, but was rendered inactive for these animals and for man after exposure to 70°C. for 30 minutes. C. considers that these latter results are due to the toxicity of the rickettsia bodies, the toxins being heat-labile. He shows the resemblance of some of these reactions to Koch's phenomenon in tuberculous animals and to the accelerated " takes " of immune persons revaccinated with vaccinia virus.—C. V. Watkins.

Dienes, L. (1936). **The Specific Immunity Response and the Healing of Infectious Diseases. Significance of Active Immunity and the Connections between the Immunity Response and the Anatomic Lesions.**—*Arch. Path.* **21.** 357-386. 4 tables. [Numerous refs.]

D. first shows that active immunization always produces certain effects in tissues which do not occur in passive immunization. He finds that pre-anaphylactic hypersensitiveness corresponds in every respect, but to a lesser degree, to bacterial allergy.

Non-specific tissue reaction at the site of an infection may considerably increase the local resistance and in some diseases (tuberculosis, smallpox and some spontaneous infections of rabbits) it may influence the whole specific response. If only small doses of the antigen used (egg-white) were absorbed, the first phase of the immunity response, corresponding to bacterial allergy, was strengthened. During this process there was a cellular increase, principally of mononuclear leucocytes, at the site of injection of the antigen. This cellular reaction was very similar to that observed in local immunization by Besredka who thought that the monocytes were responsible for the prevention of infection. If the resorption of the antigen was repeated over a longer period antibody production was increased.

D. gives several examples which show that the healing or evolution of lesions, after the immunity response is developed, depend very largely upon non-specific factors in the various organs, according to the degree in which they are present. The diseases in which the variation of these factors is apparent are tuberculosis of g. pigs, in which the lungs are comparatively immune as opposed to the spleen, which is very liable to progressive disease, and smallpox, in which there is a localization of the lesions although the virus is generalized in the whole organism.

He suggests that the anatomic lesions play a preponderant role in the whole defensive process.—C. V. Watkins.

I. Franco, E. (1936). Recherches expérimentales sur l'immunité anti-staphylococcique. (Note préliminaire). [**Antistaphylococcal Immunity**].—*Boll. Sez. ital. Soc. int. Microbiol.* **8.** 141-143. [1 ref.] [In French].

II. Franco, E. (1936). Immunité antistaphylococcique et système réticulo-histiocytaire. (Note préliminaire). [**Antistaphylococcal Immunity and the Reticulo-Endothelial System**].—*Ibid.* 139-141. [In French].

III. Franco, E. (1936). Immunité antistaphylococcique et infection provenant

de b. coli. (Note préliminaire). [**Antistaphylococcal Immunity and *Bact. coli* Infection**].—*Ibid.* 137-139. [In French].

I. Franco finds that staphylococcus toxoid confers a notable degree of resistance against a staphylococcus infection, and that it increases the antitoxic power of the serum, which also acquires slight agglutinating properties. Bacteraemia is less pronounced in treated animals.

II. It is stated that the resistance of rabbits, which have received staphylococcus toxoid, to a virulent strain of staphylococcus is much decreased by a previous intravenous injection of chinese ink. Rabbits may, however, still show some resistance as compared with non-immunized animals similarly treated with chinese ink.

III. F. reports that rabbits treated with staphylococcus toxoid by the intradermal route have some increased resistance to virulent strains of *Bact. coli*, as shown by a longer interval to death, though no effect on the bacteraemia is apparent. The blood antitoxins of animals thus infected diminish markedly during the course of the disease resulting from the *Bact. coli* infection.—A. W. Stableforth.

Schermer, S., & Kaempffer, A. (1936). Die Blutgruppen des Pferdes und ihre praktische Bedeutung. [**Blood Groups in Horses**].—*Berl. tierärztl. Wschr.* **52.** 145-146. 1 fig. [6 refs.]

S. and K. discuss the characters and possible inheritance of the various cell and serum properties already described in horses, *viz*, the cell properties A and B and the corresponding serum properties $\alpha$ and $\beta$, the occurrence of the properties A and $\alpha$ in two types (a highly sensitive and a less sensitive form), and the existence of four other properties – C, D, E and F. The frequency of their occurrence is shown schematically. S. and K. then cite two instances in which doubtful paternity was decided by means of a blood examination.—A. W. Stableforth.

## DISEASES, GENERAL.

Goerttler, V. (1936). Erweiterungsmöglichkeiten der staatlichen Tierseuchenbekämpfung. [**Suggestions for Further State Control of Animal Diseases**]. —*Berl. tierärztl. Wschr.* **52.** 429-433.

G. discusses whether or not the Reich Tierseuchengesetz of 1912 should be extended. He reviews the results obtained by the administration of the Act and, where it has been unsuccessful, mentions alterations which he considers advisable. He considers that the Act should be extended to include all diseases which cause heavy economic losses, diseases which can be eliminated by measures employed by owners themselves, and diseases which are a danger to the human population. His reason for extending the Act is based on the fact that when the 1912 Act came into force many diseases, *e.g.*, breeding diseases, equine infections, anaemia, leucaemia in its various forms, influenza in pigs, etc., were either unknown or too rare to justify inclusion in the Act.

G. stresses the fact that the success or failure of any campaign is mainly dependent on the co-operation of the stock-owners and considers that, instead of paying compensation for losses from disease, owners who have freed their herds should receive bonuses. He is of opinion that this can only be achieved by educating the farming community to the financial advantages obtained through eliminating diseases from their stocks.—G. Dods Munro.

Begg, G. W. (1936). " **Grass Disease** " **in Horses.**—*Vet. Rec.* **48.** 655-662.

An account of the history, symptomatology and morbid anatomy of grass sickness. B. considers the disease to be primarily one of the nervous system, that inhalation is the most probable route of infection, and that soil is a more important factor than grass. [Views on all these points are merely speculative in view of existing knowledge.—Ed.]. In the discussion that followed, Holmes and Sparling gave an account of the disease as seen in army horses.—Norman Hole.

Vontobel, H. (1936). Die Pyelonephritis bacteritica des Rindes. [**Bacillary Pyelonephritis in Cattle**].—*Schweiz. Arch. Tierheilk.* **78.** 365-370.

V. discusses pyelonephritis in some detail from the point of view of the practitioner. He refers to methods of diagnosis and, to some extent, to the bacteriological aspects of the condition.—G. Hartmann (Vienna-Perchtoldsdorf).

I. Schumann. (1937). Ueber die Organisation der Stuten-Sterilitätsbekämpfung. [**Organization for a Campaign against Sterility in Mares**].—*Dtsch. tierärztl. Wschr.* **45.** 106-107.

II. Pröger, K. (1937). Durchführung des obligatorischen Sterilitätsbekämpfungsverfahrens für Rinder in Thüringen. [**The Obligatory Bovine Sterility Campaign in Thuringia**].—*Ibid.* 113-116.

III. Euler. (1937). Besondere Beobachtungen in der Sterilitätsbekämpfung. [**Observations on the Campaign against Sterility in Mares**].—*Ibid.* 116-118.

IV. Wagner, H. (1937). Einiges über das Aufnehmen der Stuten unter Mitberücksichtigung des Einflusses von Jahreszeit und Futterverhältnissen. [**Influence of Season and Diet on Breeding in Mares**].—*Berl. tierärztl. Wschr.* Jan. 29th. 68-70. 1 table.

I. S. describes the recent development of the supervision of horse-breeding in Silesia. In contrast to other provinces (Rhine, Thuringia and Saxony-Anhalt), all veterinary practitioners in Silesia have been requested to take part in examining all breeding mares. S. expects to be able to secure a foal from 75% of all mares served, there being 36,000 in the province.

II. P. describes in detail the organization of the obligatory bovine sterility campaign. Records of all breeding cattle are kept in each district (" Gemeinde ") by a suitable person, who is usually the chief cattle breeder in the community. Farmers pay RM.0.30 per animal. Six veterinary surgeons, later increased to ten, are on full-time duty examining cattle for pregnancy and treating them for sterility. There are about 250,000 cattle in Thuringia. A fixed charge of RM.3 is made for treatment of each affected animal, which follows orthodox lines.

III. E. describes numerous practical points about clinical pregnancy diagnosis, the mating of mares, and sterility in domestic animals. The original should be consulted.

IV. From records kept at a large stud W. found that the months of May and June were most favourable for the mating of mares, pregnancy having been achieved in 58·8% of mares served at that time of year. About half of the mares which remained non-pregnant after summer mating were got in-foal in October and November. The significance of the results is discussed at length.—J. E.

Oppermann, T. (1936). Praktische Winke für die Diagnose und Bekämpfung der wichtigsten Schafkrankheiten. II. Krankheiten im Ablammstall. [**Diagnosis and Control of Sheep Diseases. II. Diseases of the Lambing Pen. Paralytic Diseases and Haemorrhagic Septicaemia in Lambs**].—*Tierärztl. Rdsch.* **42.** 755-758 and 915-917. [Numerous refs.] [See also *V. B.* **7.** 27].

Diseases of the locomotor system in young lambs, leading often to death, are commonly due either to septic infection or to disturbance of metabolism. The first-mentioned are due to navel infection or to infection with the swine erysipelas bacillus from the alimentary canal. To the second group belongs a muscle affection which can be found in sheep suffering from (1) under-nutrition ; (2) rations too rich in concentrates, and (3) grazing on over-rich pastures. Rickets is of less importance by reason of its rarity.

The pasteurella bacteria are facultative parasites and can only cause disease after weakening of the host (such as by railway transport, or being driven on dusty tracks). Dusty hay and litter are also predisposing factors for the infection of young sheep (" stockyard fever "). The lambs are usually affected at the time when they begin to eat solid food.—G. Hartmann (Vienna-Perchtolsdorf).

I. Monteverde, G. (1935). Le cisti nel camello. [**Cutaneous Cysts in Camels**]. —*Rass. Econ. Colon.* **23.** 490-504 and 605-619. 1 text fig., 25 figs. on 12 plates.

II. Monteverde, G. (1936). Le cisti nel camello. [**Cutaneous Cysts in Camels**]. —*Clin. vet., Milano.* **59.** 532-543 and 602-609. 19 figs.

I. Cysts which affect camels may be classified as sebaceous, serous, dermoid or epidermoid. Sebaceous cysts are acquired during life ; serous cysts may be acquired or congenital ; epidermoid cysts are usually the result of an injury but may also be congenital ; true dermoid cysts are always congenital.

Camels are more commonly affected by dermoid cysts than by other types. The predilection seat for these cysts is on the upper part of the neck on the antero-lateral aspect, just below the posterior edge of the parotid gland. They appear as swellings beneath the skin which is freely moveable over them and are usually clearly defined. They possess a rich blood supply and are attached by a peduncle to the internal fascia of that part of the neck.

On histological examination, the walls of dermoid cysts are composed of true cutaneous tissue. There is stratified epithelium which supports true skin containing the usual accessory structures such as sebaceous and sweat glands, hair follicles, etc. The centre of the cysts is filled with a mass of hair and the products of glandular secretion. It is suggested that they develop as the result of aberration in the folding of the ectoderm and blastoderm in this region and that they represent cutaneous tissue which has been isolated during the development of the embryo. Their development is slow but progressive and in old animals they may attain a considerable size. Suppuration frequently occurs and sinuses from this cause are common. Complete enucleation is the only method of treatment.

The other cysts affecting camels do not differ in their predilection seat, appearance, or treatment from similar cysts in other animals.

II. An abbreviated version of I.—J. A. Nicholson.

Fenstermacher, R. (1937). **Further Studies of Diseases Affecting Moose. II.**— *Cornell Vet.* **27.** 25-37. 5 figs., 1 table. [8 refs.]

A further progress report [see *V. B.* **5.** 836.] on five more moose, which were all observed while alive and examined carefully after death. The following parasites were found on or in one or more animals :– *Dermacentor albipictus* ; *Dictyocaulus hadweni* in the lungs ; *Echinococcus granulosus* cysts in the lungs ; *Cysticercus tenuicollis* in the liver ; *Paramphistomum cervi* in the stomach ; *Nematodirella longispiculata* in the intestines, and a nematode, identified as *Elaphostrongylus* sp., in the anterior chamber of the eye.

The results of blood picture studies are given. Negative results were obtained in experiments carried out to find if disease was caused by an infectious agent either in body tissues or in ticks.—J. E.

I. Anon. (1936). **Special Issue. Diseases of Fur Bearing Animals** (Edited by Frick, E. J.).—*Vet. Med.* **31.** No. 12. xxiv+493-560. Numerous figs. [Numerous refs.]

II. Shillinger, J. E. (1936). **Government Research on Diseases of Fur Animals.**—*Ibid.* 508-509. 2 figs.

III. Wegner, E. E. (1936). **Mink. Care, Handling and Common Diseases.**—*Ibid.* 510-515. 3 figs., 1 photograph.

IV. Green, R. G. (1936). **Fox Encephalitis.**—*Ibid.* 527-531. 9 figs. [10 refs.]

V. Secord, A. C. (1936). **Diseases of Fur Bearing Animals.**—*Ibid.* 532-549. 4 figs.

I. This is the preface to a special number of *Vet. Med.* devoted to animals of the fur-breeding industry, and particularly to details of breeding procedure, the correct methods of manipulation and restraint, and the administration of medicines. The animals dealt with include the silver fox, mink, skunk, rabbit, raccoon, fitch and chinchilla. The various articles are, for the most part, concerned with some special problem of the industry or are accounts of work among one species in particular.

The issue constitutes an up-to-date and authoritative record of the present-day relationship of the veterinarian to the industry, more particularly however, from the American viewpoint.

II. The growth of fur-farming in the U.S.A. has created many new problems. This article outlines the activities of the United States Government in relation to the fur-breeding industry, the work already carried out under official auspices, the progress made to date, and the lines which further work is to follow.

III. An article devoted exclusively to the mink. It is mainly a consideration of the diseases common to this animal, particularly those which occasion serious loss in the breeding industry. The causes of death among the new-born are first described. Distemper is frequently seen and the causal agent is believed to be the dog distemper virus. A brief account is given of the symptoms shown in mink. In the treatment of cases the employment of canine anti-distemper serum is recommended. Further notes follow on a peculiar inflammatory condition of the sheath believed to be an acidosis in origin. The internal and external parasites met with in the mink in captivity are then described, together with some notes on wounds and pneumonia.

The article includes a few remarks on the distribution of the species in nature, with special reference to the quality of the pelts met with in different localities. Oestrus and the process of reproduction and gestation are briefly described.

IV. An account of encephalitis of the silver fox as seen in the captive animal in the U.S.A. The causal agent has been proved to be a virus distinct from that of dog distemper. The occurrence, symptoms, course and transmission of the disease are each dealt with in turn. The incubation period is given as from 2 to 6 days, the duration of the attack as from 1 to 3 days with an average of 24 hours, and the mortality rate as varying according to circumstances from 2% to 40%. A specific antiserum can be prepared by the hyperimmunization of recovered foxes. Difficulties have been encountered in the development of a serum-virus method of protective inoculation.

V. A general article on fur-farming from the point of view of the veterinarian. It opens with some remarks on the methods of manipulation and restraint when

handling the various animals raised by fur-breeders. Methods of medication are then described. In regard to general anaesthesia, ether, generally speaking has been found to be safe, provided dosage is not forced too fast. Milk of magnesia has proved to be the best laxative. Mention is made of certain special difficulties encountered in the nursing of these animals, relative to their semi-wild nature. The greater part of the article, however, is devoted to an account of the injuries and diseases met with in them, among which wounds, amputations, mortality in transit, pneumonia, digestive troubles, deficiency diseases, and puerperal conditions come in for special consideration. Parasitism is dealt with in considerable detail, the names of many of the parasites peculiar to the animals being given, together with details of the symptoms, treatment and prevention of the various diseases to which they give rise. The article ends with a few remarks on certain contagious conditions, notably lobar pneumonia, paratyphoid, infectious conjunctivitis and tuberculosis of the silver fox.—C. Davenport.

I. Denmark. (1936). Bekendtgørelse af 28½December 1935 fra Ministeriet for Landbrug og Fiskeri vedrørende Bekaempelse af smitson Kyllingediarrhoe (Hønsetyfus) smitson Hønselammelse i Rugerier og dertil knyttede Hønsehold. [**Denmark. Notice on the Control of Bacillary White Diarrhoea and Infectious Fowl Paralysis**].—*Medlemsbl. danske Dyrlaegeforen.* **19.** 36-40.

II. Adsersen, V. (1936). Bekaempelsen af smitson Kyllingediarrhoe (Hønsetyfus) og smitson Honselammelse. [**Control of Bacillary White Diarrhoea and Infectious Fowl Paralysis in Denmark**].—*Ibid.* 49-59. [6 refs.]

I. The regulations concerning the control of these diseases have so far not been sufficiently effective. The new regulations only deal with " breeding farms," *i.e.*, farms selling day-old chicks and eggs for breeding. Such farms must be certified by the veterinary directorate. Flocks should be free from B.W.D. (aggl. test) but flocks where single reactors are found (not more than 2% and in no case more than 5 birds) can be certified if reacting birds are immediately removed.

II. Owners of certified farms are bound to call in veterinary assistance when suspicious cases occur and specimens of dead or killed birds should be forwarded for laboratory examination. The flocks must always be available for official inspection. A farm where a flock is declared infected loses the privilege of selling chicks and breeding eggs and of acting as a breeding centre.

—H. C. Bendixen (Copenhagen).

Hartwigk, H. (1936). Versuche zur aktiven Immunisierung von Hühnern gegen Mareksche Hühnerlahme (Neurolymphomatosis). [**Active Immunization against Fowl Paralysis**].—*Z. InfektKr. Haustiere.* **50.** 34-40. 1 table. [6 refs.]

Twelve-week-old cockerels (the progeny of a fowl-paralysis strain) were inoculated intramuscularly with material from the nerves, brains and spinal cords of fowl-paralysis-affected birds in an attempt to procure immunity. None of the inoculations conferred any immunity on the birds.

In particular a " dry vaccine" from the nerves, brain and spinal cords, as well as a " glycerine-brain vaccine " did not show any immunizing effect, whilst a " nerve-glycerine " vaccine even caused an artificial infection with fowl paralysis.

Of 44 cockerels which histological examination showed to be affected 18 (40%) had been diagnosed clinically to be affected. 26 birds (59·1%) did not show any clinical symptoms although they had been under control up to 8-13 months of age.

It is suggested that all diseased birds of accredited flocks should be examined *post mortem* and, if there is reason to suspect fowl paralysis, examined histologically. —K. D. Downham.

Roderick, L. M., Harshfield, G. S., & Hawn, M. C. (1937). **The Pathogenesis of Ketosis: Pregnancy Disease of Sheep.**—*J. Amer. vet. med. Ass.* **90.** 41-50. 4 tables. [18 refs.]

The relationship of ketosis in sheep to faulty carbohydrate metabolism is still questioned. Pregnant ewes were selected and placed in bare box stalls and allowed water, but no food. Acetonuria and an acidosis developed within two days. In the case of one ewe a section of liver was taken and was found to be loaded with fat. This ewe was then given dextrose injections and one month later, after rearing twin lambs, was killed and found to possess quite normal kidneys and liver. This experiment was repeated several times with similar results. If non-pregnant ewes and lambs were used the process of fat deposition in the liver was much slower, starvation having to proceed for usually 30 to 35 days, although acetone could be detected in the urine within 10 days. The amount of fat in the liver appeared to be directly correlated to the duration of starvation and to be commensurable to that obtained in a series of field cases of pregnancy toxaemia. In the opinion of the authors, all the usual pathological processes, both morphological and chemical, usually recognizable in cases of pregnancy toxaemia were reproduced by this simple expedient of starvation, and they conclude, therefore, that the disease is quite definitely related to carbohydrate metabolism. [The results would have been more conclusive, however, if the chemical nature of the fat in the liver produced by starvation had been proved to be similar to that obtained in the liver of cases of pregnancy toxaemia, but no chemical tests regarding the nature of the fat were carried out].—James Stewart.

I. New Zealand. (1936). **Work on Bush Sickness in New Zealand, 1935-1936.**—*Rep. Dep. sci. industr. Res. N.Z. 1935-1936.* pp. 9, 10, 30, 31, 32, 40 and 52.

II. Askew, H. O., & Dixon, J. K. (1937). **Influence of Cobalt Top-Dressing on the Cobalt Status of Pasture Plants.**—*N.Z. J. Sci. Tech.* **18.** 688-693. 3 tables. [4 refs.]

III. Kidson, E. B. (1937). **Cobalt Status of New Zealand Soils.**—*Ibid.* 694-707. 11 tables. [6 refs.]

IV. Askew, H. O., & Dixon, J. K. (1937). **Cobalt Status of Animal Organs from South Island (N.Z.) Drench Experiments.**—*Ibid.* 707-716. 8 tables.

V. Bell, Muriel E. (1937). **Some Physiological Aspects of the Cobalt Problem.** —*Ibid.* 716-719.

I. There was reason to believe that in " bush sickness " some other factor than lack of iron was responsible for the loss in weight and anaemia. The success with cobalt in Australia suggested to Cawthron Institute chemists the advisability of using it at Morton Mains and Glenhope, and results are said to be strikingly successful. Nelson soil, which contains 43 parts per million of Co was also found to be successful in preventing " bush sickness ".

In an experiment at Glenhope, feeding nickel, sheep gained 9 lb. per head, while controls lost 10 lb. per head and sheep given Co gained 38 lb. per head. At Morton Mains, bluff soils, which also are high in Co, gave markedly beneficial results when fed to growing sheep.

At the time of this report a survey of the Co content of soils, fertilizers and drench materials was being put in hand. Hamilton and Taranaki soils had already

been shown to have satisfactory Co contents of 9-22 p.p.m. as against 0·4 p.p.m. at Glenhope.

II. The necessity for giving Co to animals of certain areas, in order that they might retain health, having been proved, A. and D. tried the result of Co top-dressing of soils on plant growth and absorption by the plant of Co.

When 1 cwt. per acre of Co was supplied to pastures, the rise of Co in plants was from 0·24 p.p.m. to 74 p.p.m., while 10 lb. to the acre gave a rise from 0·2 p.p.m. to 6·7 p.p.m. Lime was found to have a depressing effect on the Co intake by the plant.

III. A large number of soils have been examined for Co soluble in concentrated HCl. The variation is from 0·3 to 380 p.p.m. Soils of " bush sick " areas have a low Co content of less than 2 p.p.m. There are, however, some areas of low Co content of soils where stock keep healthy and this is at present unexplainable.

IV. The paper deals with animals from two districts, Glenhope and Morton Mains.

At Glenhope, the Co content of organs of drenched sheep was higher than in controls ; particularly was this so of the liver and kidney. A liver of a control animal gave 0·02 p.p.m. dry weight and that of a drenched animal 0·23 p.p.m. dry weight of Co. It is suggested that an analysis of the liver should be made to determine whether " bush sickness " is present or not.

At Morton Mains similar results were obtained but, in addition, experiments showed that Co fed to the ewe may pass to the lamb prior to birth.

V. Lambs at Morton Mains, if examined early in the season, though obviously sick, show no signs of anaemia, but two months later the red cell count and haemoglobin content are both low. This anaemia does not occur if lambs are fed with Co. There were no pathological constituents present in urine from sick lambs from Morton Mains.—C. S. M. Hopkirk.

## PUBLIC HEALTH.

Anon. (1936). **The Milk (Special Designations) Order, 1936, dated April 18, 1936, made by the Minister of Health under Section 3 of the Milk and Dairies (Amendment) Act, 1922 (12 & 13 Geo. 5 c.54).** Gt. Brit. Statutory Rules & Orders 1936. No. 356. pp. 13. London : H.M. Stat. Off. [4d.]

The new grades under the Milk (Special Designations) Order are as follows :-

Tuberculin-Tested (Certified) Milk.—Tuberculin-tested cows ; farm-bottled ; methylene blue reduction in not less than 4 ½ hours in summer, 5 ½ hours in winter ; *Bact. coli* absent in 1/100 ml.

Tuberculin-Tested Milk.—Tuberculin-tested cows ; bottled or in sealed containers ; methylene blue reduction in not less than 4 ½ hours in summer, 5 ½ hours in winter ; *Bact. coli* absent in 1/100 ml.

Tuberculin-Tested (Pasteurized) Milk.—Milk from tuberculin-tested cows, heated at 145°F.-150°F. for 30 minutes ; bottled or in sealed containers ; not more than 30,000 bacteria per ml.

Accredited and Accredited (Farm-bottled) Milk.—Cows subject to veterinary inspection ; milk bottled or in sealed containers; methylene blue reduction in not less than 4 ½ hours in summer, 5 ½ hours in winter ; *Bact. coli* absent in 1 ml.

Pasteurized.—Milk heated at 145°F. to 150°F. for 30 minutes ; not more than 100,000 bacteria per ml.—J. E.

I. Savage, W. G., Medlock, F. W., Long, H. F., Price, W. T., Baum, W. W., Simpson, R., Gray, J. D. A., Davies, B., Rabagliati, D. S., Stephenson, E., Fairer, J. A., Wheeler, R. F., Mattick, A. T. R., Waley-Cohen, C., Tweed, W., Steele-Bodger, W. H., Tustin, P. B., Preston, J. E., Wain, J. H., Dixon, J. A., Orr, T., & Baxter, T. (1937). **Discussion on The Milk (Special Designations) Order, 1936, with respect to Accredited Milk.** —*J. R. sanit. Inst.* **57.** 624-670.

II. Anon. (1936). **The Grading of Milk.**—*J. R. Army med. Cps.* **66.** 392-397.

I. At a conference on the administration of the Milk (Special Designations) Order, 1936, with respect to accredited milk, papers were given by Savage, Medlock, Long and Price respectively, and several people took part in the discussion.

Savage pointed out that accredited milk was only a moderately clean and not a safe milk, and he was of the opinion that the veterinary control required did not influence its safety. He stressed the considerable differences in the interpretation of the Orders, and the lack of uniformity in the granting of licences for accredited milk in the different counties.

Medlock said that the new Milk (Special Designations) Order cleared up the confusion caused by the former Order of 1923, and that the Order gave increased scope to the veterinary officer. He was of the opinion that it was unnecessary to include anthrax, foot and mouth disease or any comatose conditions in the list of diseases under the Order, and that the administration of the Order was best carried out by local county government rather than by a central government department.

Long said that 20,000 producers of accredited milk was a small number as there were over 150,000 milk producers in the country. He further stressed the lack of uniformity in the administration of the Orders in the various centres.

Price described the carrying out of the Order in Wiltshire by various officers, and suggested that lectures and demonstrations given to farmers were very helpful.

In the discussion following, Simpson disagreed with Savage's statement that veterinary control did not materially influence the safety of milk. Baum suggested that the administration of the Orders should be carried out by the Ministry of Health. Gray described the detection of inefficient sterilization by the coliform test. Davies was of the opinion that the type of building did not materially affect the standard of milk. Rabagliati was of the opinion that the percentage of accredited herds depended largely on the efficiency of the officials in the area. Stephenson stated that the accredited scheme should be treated on a national basis and not by local governments. Fairer said that even with healthy cows and good sheds, accredited milk could not be produced unless sense was used in the handling of the utensils and the milk. Mattick, of the National Institute for Research in Dairying, stated that steam sterilization should be obligatory for every farmer in the country and that the quality of the milk would thereby be raised.

II. The Milk (Special Designations) Order, 1923, prescribed certain standards for "Certified", "Grade A (Pasteurized)", "Grade A (Tuberculin-Tested)" and "Grade A" milk, but the work of G. S. Wilson has shown the unreliability of the plate count and the *Bact. coli* test for milk, except under definite and restricted circumstances.

The main source of contamination in milk, after it has left the udder, is unsterilized utensils.

In milk kept above 50°F. *Bact. coli* multiplies rapidly. Pasteurization kills almost all of the coliform organisms. Savage points out that the legal standard is of no value with regard to the efficiency of pasteurization and he relies upon the phosphatase test.—Brennan DeVine.

I. Thieulin, G. (1936). L'hygiène du lait en France. [**Milk Hygiene in France**].—*Bull. Off. int. Hyg. publ.* **28.** 105-123. [Numerous refs.] [Also appeared in *Lait.* **16.** 337-356].

II. Anon. (1936). **What is the Quality of the Milk Supplied to School Children ? Report of a Survey by the People's League of Health (Inc.).** pp. 26. London : The People's League of Health. [8vo].

III. Morgan, M. T. (1936). Le contrôle sanitaire du lait en Angleterre et dans le Pays de Galles. [**Milk Control in England and Wales**].—*Bull. Off. int. Hyg. publ.* **28.** 81-87. [6 refs.]

I. In many cases milk is supplied direct from the farmer to the consumer, but in Paris and other large towns the retailer is employed. The farmer does nothing to ensure the cleanliness of the milk. In France milk is a by-product at the farm ; no care is taken to eliminate tuberculous animals and there is no hygienic guarantee in connexion with the milk. Milk supplied in Paris and other towns is sold in open basins in retail shops. Fortunately the consumer usually boils the milk before use. No effective measures are established for dealing with tuberculosis, mastitis, intestinal and other diseases of milking cows.

II. In this report it is stated that the classes of milk which can be considered safe from the risk of conveying tuberculosis are :– (a) milk obtained from herds certified under adequate control to be free from tuberculosis, and (b) milk which has been subjected to efficient and controlled pasteurization, or some other approved process of heat treatment.

As a result of a questionnaire sent out to various local authorities, it was found that out of 2,090,663 children dealt with in the enquiry, 269,258 received raw, untreated milk, and 88,732 received " Grade A " milk. It was ascertained that, during the years 1930 to 1935, 5·59 % of specimens of " Grade A " milk tested and 7·38 % of specimens of raw milk tested showed the presence of tubercle bacilli. The Ministry of Health is anxious that the milk for children should be made safe and secure from tuberculosis and other infections.

III. The report of the Economic Advisory Council [*V. B.* **5.** 389.] recommended that systematic veterinary inspection should be more generally applied, that the procedure for the eradication of bovine tuberculosis should be adopted, and that power should be given to the councils of large towns to enable them to prohibit the sale of tuberculous milk, or of milk which has not been subjected to an approved process of pasteurization.

The Ministry of Agriculture has introduced a scheme for the eradication of tuberculosis from milking herds. Under the Ministry of Agriculture Tuberculosis Order, it is an offence to sell milk from a cow which is affected with tuberculosis of the udder.

The Ministry of Health Orders provide for the veterinary inspection of cows in dairies from which it is suspected that tuberculous milk emanates. Animals affected with tuberculosis of the udder or tuberculosis with emaciation must be slaughtered, and the owners are indemnified. The Medical Officer of Health of a district has power to inspect a dairy and to examine the personnel employed therein.

—Brennan DeVine.

Nichols, A. A., & Edwards, S. J. (1936). **The Comparative Values of the Plate Count and the Modified Methylene-Blue Reduction Test as Routine Methods for Grading Milk.**—*J. Dairy Res.* **7.** 258-270. 1 fig., 7 tables. [19 refs.]

Evidence is brought forward to support the suitability of the modified methylene-blue reduction test for the bacteriological grading of milk. In this investigation the results of the examination of 1,000 milk samples by the plate

count and reduction test methods are compared. The conclusions are substantially the same as those set forth in the original report [*V. B.* **6.** 541].—N. J. Scorgie.

Symanzik, H. (1936). Erläuterungen zu den neuen amtlichen Vorschriften über die Erhitzung der Milch. [**New Instructions for Heating Milk (Germany)**]. —*Berl. tierärztl. Wschr.* **52.** 654-658.

S., the consulting engineer to the East Prussian Dairying Association, summarizes the essential requirements of the recently enacted laws regarding heat treatment of milk in Germany; he gives in some detail the methods allowed and lists the officially recognized plants. He deals with heating to 100°C. by means of live steam, heating at 85°C. by various methods, heating at 71°-74°C., and finally low temperature pasteurization at 62°-65°C. for half an hour.—A. W. S.

I. Duckworth, C. U. (1937). **California Plan of Dairy Inspection.**—*J. Amer. vet. med. Ass.* **90.** 396-398.

II. Merchant, I. A. (1937). **The Needs of National and State Unity in the Sanitary Control of Dairy Products.**—*Ibid.* 398-403.

III. Bundesen, H. N. (1937). **Chicago's Milk Supply – What Does it Mean?** —*Ibid.* 419-424.

I. The State Department of Agriculture and various health departments co-operate in the Californian programme of dairy inspection. Milk is sold as "graded", "ungraded" and "manufactured": 95% of the milk consumed is graded. The butter-fat content is checked by local inspectors and is under the control of civil service inspectors. Specific standards are laid down for the quality of milk prior to pasteurization and after. All milking equipment is sterilized after use. "Graded" milk is of high quality, but that does not hold true for the "manufactured" products. The role of the veterinarian is recognized.

II. A comparison between the sanitary conditions which obtained in New York in former years and the present-day standards and a discussion on the general position in the U.S.A. Since the various states have passed laws concerning the sanitary requirements, counties and cities have adopted milk ordinances with minimum requirements. At the present time there are many sanitary sheds housing healthy cows fed on wholesome food, a diet of alfalfa hay and grain.

Milking is carried out by clean mechanical milkers and in many instances rotolactors are installed and the buildings are lined with glazed tiles. The cows are washed previous to milking, the milk from each cow is checked for mastitis, and the milk sold is of a certified grade.

In 24 states milk is controlled by the State Board of Health, in 16 states by the Department of Agriculture, in 7 states by a Dairy Commission, and in 3 states by state veterinarians. There is a great need for uniformity in milk inspection throughout the states. Laboratory methods used in analysing samples of milk are uniform in the United States, but the general trend is towards having sanitary control invested in the State Board of Health.

III. The production of milk from healthy cows is but one of the factors which are essential for milk control. It is necessary to have healthy employees, regular inspection of cow-sheds and milk plants and laboratory tests. Pasteurization is considered to be one of the best safeguards for milk.

Chicago has adopted the standard ordinance and code of the United States Public Health Service. This standard lays down definite requirements for the producer and for the distributor. Chicago is supplied with "Grade A" and with "certified" milks and milk products. A school was held for inspectors and was also attended by producers and distributors. This ensured uniformity in the

inspection of Chicago's milk supply. As a result, dirty and inefficient producers were driven out of business. The improvement in the milk supply did not increase the price to the consumer. The general result is that Chicago's milk supply is safe and wholesome.—Brennan DeVine.

Kay, H. D. (1936). **Control of the Efficiency of Pasteurization of Milk : The Phosphatase Test.**—*Canad. publ. Hlth J.* **27.** 551-554. [10 refs.]

The phosphatase test utilizes the fact that the enzyme " phosphatase " present in raw milk and detectable by its action on phosphoric esters, disappears when the " holder " process of pasteurization is performed correctly, *i.e.*, 145°F. for 30 minutes. K. presents the view that this reasonably sensitive test, which is applied to the product to be consumed, constitutes a practical and reliable method of testing the efficiency of either the " holder " or the " flash " system of pasteurization.—C. A. Mitchell.

Murray, R. H. (1936). **The Survey of Pasteurization in Canada with a Record of Epidemics due to Raw Milk.**—*Canad. publ. Hlth J.* **27.** 555-559. 3 tables.

M. points out by means of tables the large number of epidemics and sporadic cases implicating milk as the factor transmitting the causative agent. He surveys the manner and extent of pasteurization as well as the number of cows tested for tuberculosis and contagious abortion, stresses the need for greater and more rigid adoption of these methods, and notes the frequent references made by municipal authorities to difficulties encountered in obtaining pasteurization of all milk offered for sale. Certain new provincial regulations will, no doubt, make this task easier for public health officials.—C. A. Mitchell.

I. Anderson, E. B., & Meanwell, L. J. (1936). **Studies in the Bacteriology of Low-Temperature Pasteurization. Part II. The Heat Resistance of a Thermoduric *Streptococcus* Grown at different Temperatures.**—*J. Dairy Res.* **7.** 182-191. 1 fig., 5 tables. [17 refs.] [See also *V. B.* **4.** 267].

II. Guittonneau, G., & Brigando, Jeanne. (1936). Sur une résistance aux colorations de certain corps microbiens acquise par chauffage dans le lait. [**Resistance to Staining Acquired by Certain Bacteria through Heating in Milk**].—*C. R. Acad. Sci., Paris.* **202.** 1622-1624. [2 refs.]

III. Barkworth, H. (1936). **A Statistical Examination of the Significance and Comparative Value of Milk Agar for Raw and Pasteurised Milk.**—*J. Hyg., Camb.* **36.** 169-172. 2 tables. [5 refs.]

IV. Breed, R. S., Hucker, C. J., Burgwald, L. H., McCrady, McH., Myers, R. P., & Thomas, R. C. (1936). **Resistance of Micrococci to Pasteurization.** —*Amer. publ. Hlth Ass. Yearb. 1935-1936.* pp. 103-105. 1 table. [12 refs.] Suppl. to *Amer. J. publ. Hlth.* **26.**

I. A. and M. deal with the effect of growth temperature of thermophilic streptococci on subsequent heat resistance. It was found that cultivation at temperatures below those for optimum growth, or storage of the cultures for 24 hours at 3° to 4°C., during the early logarithmic phase of growth, increased the heat resistance of the organisms. The possible significance of these results with respect to the storage of pasteurized milk and the subsequent " resistant count " is pointed out.

II. When milk is submitted to a temperature of 100°C. for one hour or 120°C. for 20 minutes, certain of the common bacterial flora, particularly the lactic acid group, become resistant to the staining action of methylene blue, anilin gentian violet, Unna's blue, erythrosine, haematoxylin and carbol-fuchsin

(Ziehl). If, however, the preparations are washed with dilute acetic acid before staining, the organisms take the dye normally. G. and B. have investigated this problem and the conclusion reached is that this dye resistance of the bacteria is caused by thermal alteration of the phosphocaseins in the heated milk.

III. The addition of 1% fresh unheated skim milk filtered to make it sterile, to the official medium for routine plate counts of milk increases the number of colonies in the plates [*V. B.* **3.** 435]. In a statistical analysis of his own results and of those of other workers, B. finds that the increase in colony numbers is significant for both raw and pasteurized milk at all levels of count. Milk agar also gives better colony growth, tending to more rapid and accurate counting.

IV. This report summarizes the data available on the presence of micrococci in pasteurized milk. It appears that the members of this genus exhibit great variability in their heat-resisting properties. Many species have thermal death times considerably greater than 30 minutes at 143·5°F. High bacterial counts from pasteurized milk may thus be due to the presence of such organisms. In many cases the source of these micrococci is the bovine udder.—N. J. Scorgie.

Hertha, K. (1936). Die Entstehung multipler Blutungen in der Muskulatur von Tieren, die bei der Schlachtung mit Hilfe des Schlachthammers betäubt worden sind. [**Muscle Haemorrhages in Animals Stunned by Hammer**]. —*Tierärztl. Rdsch.* **42.** 829-834. 2 figs. [5 refs.]

Hertha, K. (1936). Die Entstehung multipler Blutungen in der Muskulatur von Schweinen, die bei der Schlachtung durch Bolzenschuss betäubt worden sind. [**Muscle Haemorrhages in Swine Stunned by Captive Bolt**].—*Ibid.* 854-856. [3 refs.]

Hertha, K. (1936). Die Entstehung multipler Blutungen in der Muskulatur von Schweinen, die durch elektrischen Strom betäubt worden sind. [**Muscle Haemorrhages in Swine Stunned by Electricity**].—*Ibid.* 891-892. [1 ref.]

Ziegler, M. (1936). Ueber die Entstehung der multiplen Blutungen und der Muskeldegenerationen bei Schlachttieren. [**Haemorrhages and Muscle Degeneration in Abattoir Animals**].—*Ibid.* 899-900.

Hertha, K. (1936). Die Verhütung multipler Blutungen in der Muskulatur bei der Schlachtung von Schweinen. [**The Prevention of Muscle Haemorrhages in Slaughtered Swine**].—*Ibid.* 935-936. [4 refs.]

This is a series of articles dealing with the causes and prevention of muscle haemorrhages in abattoir animals. In hammer stunning, haemorrhages result from hitting the skull near the occiput instead of over the centre of the forehead. The animal's head should, therefore, be effectively secured, but this has not been found possible with swine. In the captive bolt method, haemorrhages result when the shot is directed so that the penetration is anterior to the brain, into the nasal cavity. The remedy is to direct the shot towards the posterior part of the cerebral cavity (the pig's head being held horizontally). The haemorrhages arising in electrical stunning of swine are produced when the electrodes slide along the neck below the first and second cervical vertebrae. This inevitably happens so quickly that H. thinks that it is impossible to remedy it.

In hammer and electrical stunning, H. shows that, apart from the need of ensuring good " aim " in directing the implement, it is also possible to prevent muscle haemorrhages in pigs, provided that the animals are bled before diapedesis starts, *i.e.*, within 65 seconds from the start of stunning, or within 50 seconds after stunning.

Z. states that the reddish-grey muscle degeneration sometimes seen in abattoir animals is due to injury of the vaso-motor centre in the brain during the process of stunning.—N. J. Scorgie.

I. Schornagel, H. (1936). Tuberkulose bij slachtdieren. [**Meat Inspection in Relation to Bovine Tuberculosis**].—*Tijdschr. Diergeneesk.* **63.** 1325-1331. [English, French and German summaries].

II. van Oijen, C. F. (1936). De keuring van slachtdieren. Lijdende aan tuberculose. [**Meat Inspection of Tuberculous Animals**].—*Ibid.* 1332-1345. [English, French and German summaries].

I. A general paper on meat inspection for TB. S. found that the frequency of TB. in the spleen, liver and kidneys is 1 : 5 : 3 in cattle, 1 : 5 : 1 in pigs, and 16 : 4 : 1 in horses.

II. The author deals at some length with types of TB. found in slaughter animals and on their significance for the condemnation of the carcasses in part or whole. The original must be consulted.—M. J. J. Houthuis (Rotterdam).

Bauer. (1936). Die Bekämpfung der Enteritis in den Viehbeständen im Anschluss an die Feststellung von Fleischvergiftern. [**Enteritis in Cattle ; its Control and Association with Food Poisoning**].—*Dtsch. tierärztl. Wschr.* **44.** 592-595.

Various instances are given of the rules or regulations in force in different areas for controlling food poisoning by the prevention of its occurrence through diseased cattle. There is an undoubted association between food poisoning in human beings and two conditions in cattle associated with similar organisms, namely, calf paratyphoid and the " carrier " cow. The latter may excrete pathogenic organisms and thus be a source of danger.

The two organisms most frequently met with in these conditions are *Salmonella enteritidis* or one of its varieties, and *S. typhi-murium*.

In emergency-slaughtered animals which are suffering from active infection there are signs of catarrh of the intestine and swelling of the spleen and lymph nodes.—R. Lovell.

Kathe, & Lerche. (1936). Bakterielle Lebensmittelschädigung durch Enteneier. [**Bacterial Food Poisoning from Ducks' Eggs**].—*Zlb. Bakt. I. (Orig.).* **136.** 320-326. 2 tables. [14 refs.]

A report of an outbreak of food poisoning in man due to the consumption of eggs contaminated with *Salmonella enteritidis*. The eggs were laid by a duck infected with this organism, and other ducks, one goose and four pigs on the same farm were also found to be infected. Thorough cooking of eggs is advocated. —E. J. Pullinger.

## THERAPEUTICS.

Pearson, A. M. (1935). **An Improved Method for the Determination of Cattle Fly Spray Repellence.**—*J. econ. Ent.* **28.** 160-161. 1 table. [6 refs.]

After preliminary washing cattle are sprayed daily at 6 a.m. for four consecutive days, with a base oil alone, and hourly fly counts are then made until 4 p.m. As a result of these counts the animals are placed in groups on a basis of their individual fly susceptibility, and spraying is then repeated during the following four days with the same base oil to which the repellent ingredient under test has been added. Fly counts are made hourly as before and the material under test is judged for its relative repellence.—J. M. L. Penhale.

Kurzrok, R., Bates, R. W., Riddle, O., & Miller, E. G., Jr. (1934). **The Clinical Use of Prolactin.**—*Endocrinology.* **18.** 18-19. 1 table. [1 ref.]

The authors report the results of the effect of prolactin in stimulating lactation in women. In most of 29 cases in which lactation had not developed adequately by the sixth day, doses of 150 units, followed in many cases by 100 the next day, produced satisfactory results. In cases in which lactation was already normal, little or no increase was produced.—A. W. Stableforth.

## PHYSIOLOGY.

Maly, F. (1935). Obsah magnesia v krevním seru skotu, ovci a vepřů za poměrů fysiologických a pathologických. [**The Blood Magnesium of Cattle, Sheep and Swine in Health and Disease**].—*Klin. spisy Šk. zvěrolék., Brno.* **12.** 39-80. 14 tables. [German summary].

The following maximum, minimum and average figures are given for blood Mg in mg. per 100 c.c. Healthy cows 1·21 to 3·0 (1·94), cows with milk fever 2·5 to 4·2 (3·42), cows with osteodystrophic conditions 1·46 to 3·0 (2·13), tuberculous cattle 1·21 to 2·32 (1·69), sucking calves 1·29 to 2·24 (1·72). Healthy sheep 1·0 to 2·2 (1·79), sheep with fascioliasis 1·62 to 2·74 (2·21). Healthy pigs 1·17 to 3·44 (1·85), and pigs with rickets 2·16 to 3·12 (2·54).—E. Přibyl (Brno).

I. Davey, D. G. (1936). **Notes on the Osmotic Pressure of the Contents of the Stomach Compartments of the Sheep.**—*J. agric. Sci.* **26.** 328-330. 3 tables. [5 refs.]

II. Quittek, G. (1936). Ein Beitrag zur Frage der Fettbildung im Pansen des Schafes. [**Fat Formation in the Rumen of Sheep**].—*Inaug. Diss., Berlin.* pp. 31. 6 tables. [Numerous refs.]

I. It has been recorded by several German workers that absorption can take place from all four compartments of the stomach of the sheep. During an investigation into the physiology of nematodes inhabiting the abomasum osmotic pressure values were estimated, by the freezing-point method, of the abomasal contents and were found to be constant for 15 sheep. The osmotic pressure of the blood was also determined and found to vary between 0·570 and 0·620, a very close value to that obtained for the osmotic pressure of the abomasal contents and that of the other compartments of the stomach. D. suggests that the approximate identity of the values can best be explained by assuming that absorption can take place from all the compartments of the stomach.

II. By means of a fistula, rumen contents of sheep fed on hay were withdrawn at the third, sixth and ninth hours after feeding and the fat and nitrogen content estimated, by the Soxhlet and Kjeldahl methods respectively. It was found that, despite a decrease in dry-matter content, both the fat and nitrogen contents increased proportionately to the duration of digestion. The iodine numbers and saponification values of the fats isolated were estimated. Q. concludes that the increase in fat and nitrogen is related to the breakdown of the cellulose fraction of the food-stuff. The possible action of ciliates in the rumen with regard to this increase of fat and nitrogen is also discussed.—James Stewart.

Gildemeister, E. (1936). Untersuchungen über das Lysozym. [**Lysozyme**].—*Zlb. Bakt. I. (Orig.).* **136.** 408-412. [16 refs.]

G. finds that lysozyme from egg albumen passed completely through a cellophane membrane which held back a bacteriophage [nature not stated] which he tested under the same conditions. He concludes that it must therefore have a smaller molecule and that this finding is evidence against any similarity between

lysozyme and bacteriophage in general. Investigations of the lysozyme content of eggs incubated for various periods and of the organs of healthy and diseased mice did not give any satisfactory indication regarding the role of lysozyme in the animal body. The observed differences seem to obey no recognizable rule. —A. W. Stableforth.

## TECHNIQUE.

Graham, W. R., Jr., Kay, H. D., & McIntosh, R. A. (1936). **A Convenient Method for Obtaining Bovine Arterial Blood.**—*Proc. roy. Soc.* Ser. B. **120.** 319-329. 1 fig., 5 tables. [11 refs.]

Accurate comparison between the composition of the arterial blood entering the udder and the venous blood leaving the udder of an actively lactating cow is an essential preliminary to a study of milk precursors. For this purpose venous blood may be obtained with relative ease from one of the abdominal subcutaneous veins which drain the mammary gland. The collection of arterial blood, however, presents difficulties.

The authors describe a method by which large quantities of arterial blood may be obtained with ease and regularity from the internal iliac artery of a cow by means of puncture through the rectal wall. The technique of the operation is given in detail. It is claimed that with practice the whole can be competed in about three minutes without disturbance to the cow and with no afterl effects. A number of tables are included showing the results of analysis of some typical arterial and venous blood samples obtained in the manner described.—C. D.

Fischer, G. (1936). Einige Verbesserungen der Technik bei Blutkulturen. [**New Bottles for Blood Culture Work**].—*Zlb. Bakt. I. (Orig.).* **137.** 399-400. 2 figs. [3 refs.]

This article gives the method already described by McCartney [(1931). *Lancet.* **220.** 583].—E. J. Pullinger.

Mapleston, P. A., & Mukerji, P. K. (1936). **An Improved Technique for the Isolation of Ascaris Eggs from Soil.**—*Indian J. med. Res.* **23.** 667-672. 3 tables. [4 refs.]

The soil is shaken in test tubes with 2·13% caustic soda; chlorine is then bubbled through the mixture, and the eggs separated by means of Lane's centrifugal floatation technique, using saturated salt solution. It was found that more eggs could be recovered from moist soil than from soil which had been allowed to become dry, and this is thought to indicate that ascaris eggs are quickly destroyed in dry soil.—E. L. Taylor.

Armitage, F. D. (1936). **A Method for the Preparation of Mange Mites for Microscopical Examination.**—*Vet. Rec.* **48.** 1404-1406. 5 figs.

This article gives details of certain modifications in the usual technique for the preparation and isolation of parasitic acari for microscopic examination. After digesting the hair in heated KOH, the sample is placed in a separating funnel to permit sedimentation and to facilitate the transfer of small quantities to microscopic slides. On the slides the acari are separated from the debris by means of an " air needle " *viz*, a fine glass tube through which air is slowly expressed by means of water pressure.—C. Davenport.

KIDSON, E. B., ASKEW, H. O., & DIXON, J. K. (1936). **Colorimetric Determination of Cobalt in Soils and Animal Organs.**—*N.Z. J. Sci. Tech.* **18.** 601-607. 5 tables. [4 refs.]

A chemical paper dealing with the nitroso-R-salt method of determination of cobalt in various types of substances.

The authors have evolved a reliable method of assessing the cobalt content of pastures and animal organs.—C. S. M. HOPKIRK.

## MISCELLANEOUS.

ANON. (1936). **Council for Scientific and Industrial Research. Ten Years of Progress, 1926-1936.** pp. 67. 14 figs. Melbourne: Govt. Printer. [4to].

The purpose of this booklet is to give to the general public who are out of touch with scientific research a general account of the Council's organization, achievements and present work.

The work is organized in five divisions, of which the division of Animal Health and Nutrition, under the direction of Dr. L. B. BULL, is one. The division of Economic Entomology under Dr. A. J. NICHOLSON is also partly engaged on work of veterinary importance with regard to blowflies and buffalo flies.

The work of each division is described separately in about six pages each. The Council has veterinary research stations in North Queensland, Sydney and Melbourne, but veterinary work is also carried out in other parts by individual research workers.

The principle veterinary work done during the decade has been on anaerobic infections of sheep, contagious bovine pleuro-pneumonia, tick-borne diseases, sheep parasites, tick paralysis in dogs and mineral deficiency.—J. E.

ANON. (1936). Wissenschaftliche Berichte des VI. Weltgeflügelkongresses 24. Juli bis 2. August 1936, Berlin und Leipzig. Band I und II. Hauptberichte und Sektionsmitteilungen. Band III. Schlussbericht, Zusammenfassungen und Diskussionen. [**Proceedings of the 6th World Poultry Congress held at Berlin and Leipzig, 24th July to 2nd August, 1936. Vols. I and II. Reports and Sectional Papers. Vol. III. Summaries and Discussions**]. pp. xx + 367 + vi + 276 and 530. Numerous figs. and tables. [Numerous refs.] Berlin & Leipzig: VI. Weltgeflügelkongress. [8vo] [In English, French, German, Italian and Spanish].

The papers presented were grouped into six sections and one general report group, which latter, and section four, deal with poultry diseases.

The original articles have been dealt with in the *Veterinary Bulletin* in the usual way. The articles are in English, French, German, Italian and Spanish, and an extra booklet gives briefly summaries in English.—J. E.

NIELSEN, M. (1936). Danske retsregler vedrørende husdyrhandel og dyrlaegernes handelsattester. [**Danish Laws on Livestock Trade and on its Veterinary Aspect**].—*Medlemsbl. danske Dyrlaegeforen.* **19.** 525-540.

The purchaser of an animal which is found defective can claim against the vendor. The defect must be of certain importance and the claim must be made as soon as possible, and not later than 30 days after the purchase. Where a "not open" defect is concerned the buyer has the following choice of procedure :– (1) the purchase can be cancelled; (2) he can get a proportional reduction of price,

and (3) under certain circumstances he can obtain compensation. In some cases a combination of these procedures can be arranged.

The regulations are mainly based upon the Law of Purchase (1906) and upon the Arbitration Law concerning Disagreements in Livestock Trade (1922). The majority of livestock trade cases are settled according to the latter law. The court of arbitration is composed of laymen.

Evidence given by the veterinarians must in every case be in the form of a certificate giving a definite and correct version of facts as found by personal examination.—H. C. Bendixen (Copenhagen).

Korkhaus. (1936). Der Tierschutz im nationalsocialistischen Staate und Sinne. [**Animal Welfare in the Nazi State**].—*Dtsch. Tierärztebl.* **3.** 525-528.

It is claimed that the general attitude of the German people to animals has changed for the better in the new national socialist state of Germany, and this is attributed to the influence of the Führer himself. The first society for the protection of animals was founded a hundred years ago, but there was no efficient Protection of Animals Act until that passed in 1933. Any wanton cruelty to animals is now punishable, the sale of steel-traps is prohibited, cruel sports are forbidden, the lot of pit ponies is improved, the cramming of poultry is stopped, and unqualified veterinary practice is restricted. K. urges that the next step is to educate the children of the Reich in kindness to animals.—F. Bullock.

Grzimek. (1936). Der Geflügelgesundheitsdienst des Reichsnährstandes – ein Betätigungsfeld für den praktischen Tierarzt. [**The Poultry Health Service of the Reich Nährstand – a New Field of Work for the General Practitioner**]. —*Dtsch. Tierärztebl.* **3.** 441-443.

A system of supervision of the health of poultry has been established in Germany. An attempt is being made to increase the supply of healthy young birds and to protect the flocks from disease. The Director of the Poultry Health Service appeals to veterinary surgeons to take up this work and offers to supply assistance by way of advice as to the technique of blood tests, the administration of medicaments, and generally to supply information about poultry keeping and breeding. —F. Bullock.

Lägel. (1936). Das tierärztliche Schweigegebot nach der Reichstierärzteordnung. [**The Obligation of Silence Imposed on Veterinary Practitioners in the New German Veterinary Order**].—*Dtsch. Tierärztebl.* **3.** 467-469.

The new order imposes the duty of keeping secret any facts which become known to the veterinary surgeon in the exercise of his calling. If, however, public interests require the making known of what he has observed, then the practitioner is not bound by the order. In general the rule merely means that the practitioner must not divulge anything, discovered during his practice, which if made known might cause injury or unpleasantness to his client. The rule does not apply, however, to proposals for insurance, where the veterinary surgeon must disclose everything he finds at the examination of the animal to be insured.—F. Bullock.

von Ostertag, R. (1937). Zur Geschichte des Veterinärwesens in den deutschen Kolonien. [**History of Veterinary Affairs in the German Colonies**].—*Berl. tierärztl. Wschr.* Jan. 29th and Feb. 15th. 77-80 and 92-95.

The author visited the former German colonies on two occasions, South-West Africa in 1910 and East Africa in 1913. His work on the former occasion was to investigate an outbreak of sheep pox which had been introduced by sheep imported

from India. He was able to control the outbreak in three months, and to lay down rules to prevent its recurrence. He also studied, in addition to animal husbandry in general, the incidence of glanders, sheep scab, mange, malignant catarrh in sheep and contagious bovine pleuro-pneumonia. His visit to East Africa in 1913 was to test the measures adopted for the control of rinderpest and to discover whether malignant bovine catarrh of cattle was a disease *sui generis*, or another form of rinderpest.—F. BULLOCK.

## OFFICIAL AND OTHER REPORTS.

UGANDA PROTECTORATE. (1936). **Annual Report of the Veterinary Department for the Year ended 31st December, 1935.** [POULTON, W. F.] pp. 20. 2 tables. [5 refs.] Entebbe: Govt. Printer. [fcp] [Shs.1/50].

The staff consisted of 20 Europeans, 6 Asiatics and 58 Africans.

ANIMAL DISEASES.—A focus of RINDERPEST was in existence at the beginning of the year and this, as well as an extension and a fresh outbreak, was eradicated by the end of May by means of double inoculation after which the Protectorate remained free from the disease for four months, when two other outbreaks were recorded. During the year, memorable as the freest from rinderpest since 1915, there were altogether six outbreaks, only one of which, on the Sudan border, was attributed to infection contracted from game (buffalo). CONTAGIOUS BOVINE PLEURO-PNEUMONIA is believed to be enzootic in an outlying district and lesions of the disease were seen in one animal moved from that area to a central abattoir. TRYPANOSOMIASIS of cattle was common, except in the Eastern Province, and was seldom due to direct contact with tsetse (*Glossinae*). More frequently outbreaks are attributable to the movement of infected, although apparently healthy, cattle into a herd in which large numbers of bloodsucking flies such as tabanus, haematopota and stomoxys are present. These flies find the climate and vegetation favourable to their existence. This applies particularly to *Tryp. vivax* and *Tryp. congolense*. *Tryp. brucei* is usually associated with outbreaks in which tsetse are the vectors.

ANTHRAX caused a few deaths among stock and a few in natives who had consumed infected flesh. BLACKLEG was reported from all districts and was controlled in some areas by vaccination.

TUBERCULOSIS is seen most often in the non-zebu type of Ankole cattle at the abattoirs, up to 41% of these showing lesions. Although rare, the disease was also seen in the zebu type of cattle of the Eastern Province, and also among goats in Ankole. BOVINE CONTAGIOUS ABORTION was diagnosed by the aggl. test in 5 out of 10 suspected cases. FOOT AND MOUTH DISEASE appeared likely to cause some interference with the milk and meat supplies of two of the principal townships, but it soon died out under quarantine.

The TICK-BORNE DISEASES (piroplasmosis, anaplasmosis and East Coast fever) develop in calves in most areas, soon after birth, causing retarded growth in those which recover, mortality being higher in those kraals less frequently moved on to clean ground. RABIES was diagnosed for the first time in Uganda in dogs. To control it, an active campaign of laying poison meat baits resulted in the known deaths of 20 dogs, 76 jackals, 4 hyenas, 1 leopard, 2 pigs and 10 hawks.

DOG DISTEMPER and CANINE PIROPLASMOSIS were observed as in former years and MANGE of goats was common and in some cases caused heavy mortality.

In badly run flocks of poultry, COCCIDIOSIS, FOWL POX and HELMINTH INFESTATION are seen, and in unvaccinated flocks, FOWL TYPHOID is liable to take heavy toll.

Glossina Investigation and Reclamation Work.—This received a set-back in one area through a poacher who by harrying the game on the edge of a fly area caused them to move over a 5,000 foot high ridge, taking " fly " with them into a clean area, where the " fly " has now established itself and will have to be evicted. Elsewhere progress was maintained and controlled grass burning has now been introduced to prevent " fly " spreading from its haunts.

Education.—It is difficult to comply with all the requests made by the various education policies for instruction of the natives on stock matters. In addition to the training of departmental staff, lectures and demonstrations were given to agricultural students, pupils at farm schools, and to market masters on meat inspection. The native staff employed as travelling castrators also give advice on breeding and animal management.

Animal Industry.—A short review of the position is given.—R. L. L. Hart.

Uganda Protectorate. (1936). **Annual Report of the Veterinary Pathologist, Entebbe, for the Year 1935.** [Mettam, R. W. M.]—*Rep. vet. Dep. Uganda, 1935.* pp. 15-19. [5 refs.]

The technical staff consisted of the Veterinary Pathologist and the Assistant Veterinary Pathologist. In addition to the routine work of the laboratory several new paddocks were cleared and fenced, museum specimens were arranged and new library accommodation was taken over.

Nearly 1,200 units of anti-rinderpest serum were prepared. No research work was done on Rinderpest.

Trypanosomiasis.—857 serological tests with different reagents were carried out in an attempt to find an improved method for the diagnosis of trypanosomiasis. The results were inconclusive but were considered to be promising. Observations made on artificially infected cattle showed that they are more susceptible to *Tryp. brucei* than is usually supposed and that *Tryp. brucei* and *Tryp. rhodesiense* behave very similarly and produce similar pathological conditions.

Experiments with calves showed that while they exhibited a marked resistance to a strain of *Tryp. congolense*, which killed adult cattle in 6 to 8 weeks, general unthriftiness and delayed growth followed infection.

Treatment of infected cattle with " surfen C " was efficacious against all these trypanosomes, but as a prophylactic its success is not yet certain although animals can be exposed to infection up to 21 days after its administration with good results.

Research on the Theileriases revealed that native cattle have a certain amount of resistance to East Coast fever, while graded cattle have none and, while *Theileria mutans* hardly affects the former, it may, especially if adverse conditions such as drought or reaction to other diseases, etc., prevail, produce severe and sometimes fatal results in the latter group.

Tuberculosis research consisted of the typing of strains recovered from human and animal sources. The bovine type was isolated from pulmonary lesions of four natives who had worked in contact with cattle.

Both the zebu and ankole cattle are equally susceptible to the European bovine type but zebus are more resistant than ankoles to the local bovine type. TB. is far from rare in the sheep and goats of Ankole and the human type was recovered from one fatal case in a sheep.

Bovine Contagious Abortion was again diagnosed serologically.

Rabies was definitely diagnosed for the first time in Uganda, from the brains of dogs by the finding of Negri bodies. Blue Tongue virus obtained from Onderstepoort was injected into local sheep. No reactions followed and it is considered that the immunity of these sheep is strong evidence that the disease exists in Uganda.—R. L. L. Hart.

SUDAN GOVERNMENT. (1937). **Annual Report of the Sudan Veterinary Service, 1936.** [WILLIAMS, H. B.] pp. 1-19. [fcp] [Mimeographed].

The professional staff consisted of the Director, the Assistant Director and Senior Research Officer, the Research Officer, and 11 Veterinary Inspectors. The only significant staff change was the appointment of the Senior Research Officer as Assistant Director in addition to his other duties.

DISEASES OF ANIMALS.

RINDERPEST had been on the increase towards the end of 1935, and continued to become intensified until in the dry season it was probably more wide-spread than at any time in the country's history. A " record " output of serum and vaccine did much to minimize losses, but it was impossible to check the spread of the disease.

" The heavy losses which occurred in untreated herds would undoubtedly have been greatly lessened had cattle owners resorted to the quarantine methods employed before the coming of prophylactics [a very recent development in the pastoral areas of the Sudan], but they have during the past few years become so accustomed to having their cattle inoculated immediately rinderpest appears, that this year, when owing to the widespread nature o the epizootic all demands for serum could not be met, many of them made no attempt to quarantine their herds."

About 280,000 cattle were given either serum or vaccine as compared with slightly under 200,000 in 1935.

CONTAGIOUS BOVINE PLEURO-PNEUMONIA became epizootic in Darfur Province, in which many enzootic centres previously existed.

" The Arabs now realise the value of vaccine and immediately report outbreaks but, as in past years, the greatest difficulty has been experienced in getting them to destroy their infected beasts. Until they appreciate the necessity of doing this, little headway can be made in freeing the country of this insidious disease."

In some other provinces infection was light and in the Eastern Province no outbreak occurred. 51,000 odd doses of vaccine were issued to the field staff.

FOOT AND MOUTH DISEASE again occurred in its usual mild form. With the exception of a few cases detected in the export quarantine parks, it was confined to the Western Province, where it caused little damage to native herds, but was responsible for some interference with the export of cattle to Egypt.

TRYPANOSOMIASIS due to *Tryp. evansi* was unusually prevalent in camels in consequence of heavy rains. Extensive treatment with " naganol " reduced the losses among government camels to a minimum, while over 8,800 private owners paid for treatment as against 7,600 in 1935. Tsetse-borne trypanosomiasis of other animals was confined to well-known infected areas, and was therefore not extensive.

HORSE-SICKNESS was no more prevalent than usual in spite of abnormally heavy rains. Over 400 vaccinations were carried out [with neuro-vaccine – see below], and no vaccinated horse subsequently died of the disease.

RABIES remained wide-spread. Forty positive cases were diagnosed (33 dogs, 5 donkeys, 1 cat and 1 sheep) in material from all provinces except Darfur and the Upper Nile, but these are probably also infected. Sixty-one cases were diagnosed in 1935.

TRADE IN LIVESTOCK AND PRODUCTS.

The number of cattle exported fell from 14,604 – valued at £E.63,769, to 10,471 – valued at £E.44,791, and that of sheep from 21,657 – valued at £E.21,034, to 11,110 – valued at £E.11,726.

Hide exports rose from 1,226 tons – valued at £E.45,768, to 1,462 tons – valued at £E.69,014.

IMPROVEMENT OF LIVESTOCK.

Endeavours to improve the type of local cattle have been limited to the castration [with " bloodless castrators "] of unsuitable males. In the case of horses it has been decided that the use of imported sires should be limited as far as possible to Arabs, and that locally-bred stallions should be increasingly used instead of imported ones. [The progeny of imported sires usually fail to withstand local conditions, but a small infusion of Arab blood has been found beneficial].

EDUCATION.

" Two ex-Gordon College boys were absorbed into the Service for instruction in Animal Husbandry and Animal Industry. It is proposed to give these students a two years' course of training and later to utilise them as ' extension officers ' to improve the quality of animal products and to establish closer contact between primary producers and exporters. It is hoped that this small beginning will be only the first step towards a more comprehensive programme of veterinary education, whereby an adequate staff of highly trained Sudanese Veterinary Assistants will be built up."

—S. C. J. BENNETT.

SUDAN GOVERNMENT. (1937). **Annual Report of the Senior Research Officer, Sudan Veterinary Service, 1936.** [BENNETT, S. C. J.]—*Rep. vet. Dep. Sudan, 1936.* pp. 20-31.

The Senior Research Officer has been appointed Assistant Director, Sudan Veterinary Service, in addition to his existing duties. As regards duties the main feature of the year has been the official recognition that routine work has at last developed to such a level that research must be deliberately abandoned.

RINDERPEST SERUM.—A " record " quantity of 124,000 " doses " of 50 c.c. was prepared. This is considered to be about the maximum quantity that can be prepared, and represents an increase of from 20% to 25% over the earlier maximum, which has been effected by a 100% greater expenditure on cattle. It has been difficult to obtain the necessary cattle, since the owners have no desire to sell.

RINDERPEST VACCINE.—130,723 doses were prepared and issued as against 41,646 in 1935, all available " raw material " being utilized. Plain glycerinized lymphoidal tissue is used, of which a dose of 1 g. per 100 kg. body weight produces in one week an immunity that persists for about one year.

CONTAGIOUS PLEURO-PNEUMONIA VACCINE.—51,740 doses were issued as compared with 51,090 in 1935; this was the largest output up to date. The year had its usual one inexplicable " accident " when a strain of culture-virus, of which 15,000 doses of generations from the 23rd onwards had been safely used, apparently produced a crop of swellings and some deaths when in its 47th to 50th generations. There was no time to investigate the circumstances. The vaccine " appears, however, to be very popular and, although not guaranteed as either entirely safe or absolutely infallible, demands continue to increase."

CAMEL TRYPANOSOMIASIS.—Diagnosis is effected by the mercuric chloride test, and positive reactors are treated with a single 5 g. dose of " naganol " (in watery solution) given intravenously. The 5 g. dose was introduced in place of the earlier 4 g. dose in order to prolong the average period after treatment during which camels would resist reinfection. " It has not been possible to keep accurate records, but it is probable that in general the object has been achieved." 10,701 doses of " naganol " and comparable quantities of accessories were issued as against 2,901, 4,219 and 10,081 in the three preceding years.

AFRICAN HORSE-SICKNESS.—Over 400 doses of neuro-vaccine, imported from Kenya by air, were used in well-known horse-sickness areas [strictly speaking

about 100 of these should be reckoned as appertaining to the 1935 season]. No deaths occurred among vaccinated horses, although many unvaccinated horses died in the same areas.

Morbid Specimens.—The following interesting cases were observed :– (1) a lachrymal cryptococcus infection in a horse ; (2) a case of globidium infection in a horse (originating in southern Kordofan, as have all earlier cases) ; (3) haemorrhagic septicaemia (pasteurellosis) in a camel and in a bull – rare diagnoses in the Sudan, and (4) two cases of bovine tuberculosis, both in Southern Longhorn cattle ; " an interesting observation, in that it has recently been found in Uganda that the true African long-horned beast is relatively highly susceptible as compared with the zebu." [Bovine tuberculosis is exceedingly rare in the Sudan, but all recorded cases have occurred in the African Longhorn type of beast].

Hides.—Many hides become available in the two laboratories, and they are used both to investigate the best technique of flint-drying, and for the demonstration of approved methods of flaying and of curing.

Research.—No deliberate research has been contemplated. Some observations were, however, carried out on an ablepharoplastic variant of *Tryp. evansi* which was accidentally found to affect camels. It appears to be wide-spread (topographically) but rare, but no further observations are yet available.

Jamaica. (1936). **Report of Government Veterinary Surgeon for Year 1935.** [Lockett, S.]—*Rep. Dep. sci. Agric. Jamaica, 1935.* pp. 33-43.

The year was rather a poor one for livestock owing to subnormal rainfall and unfavourable economic conditions.

Animal Diseases.—Two outbreaks of anthrax occurred. Bovine tuberculosis is believed to be present to a great extent but no scheme of tuberculin testing has yet been drawn up. It is thought that bovine brucellosis is present also. Ulcerative lymphangitis was very common in plantation mules, which are very badly kept in muddy yards. Bovine piroplasmosis was enzootic ; animals become infected as calves and have some immunity when they grow up. Systematic dipping was employed in some districts. It was disquieting to observe that the heaviest losses occurred in herds of European breeds in which dipping was regularly carried out, it being supposed that dipping prevents the acquirement of natural immunity. No cases of F. & M. disease or swine fever was observed. Psoroptic mange was very widely spread in the equines of the colony, and could be eradicated if energetic dipping were practised. Lice caused much trouble to goats in some districts. A list of the helminth parasites of domestic animals is given. Fowl pox and fowl cholera are the most important fowl diseases. Reference is made to the poisoning of cattle by Jamaica nightshade (*Urechites suberecta*).

An account is given of the history and health of livestock on the various government farms and other institutions.—J. E.

Portugal. (1936). Nota estatistica dos serviços oficiais do instituto Camara Pestana em 1933, 1934, 1935. [**Statistics of Work Done by the Camara Pestana Institute in 1933, 1934 and 1935**].—*Arch. Inst. bact. Cam. Past.* **7.** 255-266.

The following is of veterinary interest :– *Brucella abortus* was cultured from " diseased material " 4 times in 1933 and 5 times in 1934.

In 1933 rabies was diagnosed in 5 dogs and 1 cat, in 1934 in 2 dogs and 1 " other animal " [not cat], and in 1935 in 8 dogs and 1 " other animal " [not cat].

—J. E.

AUSTRIA. (1936). Autriche. Compte rendu de la section de diagnostics de l'Institut fédéral de Mödling pour la prophylaxie des maladies épizootiques pendant l'année 1935. [**Report of the Federal Institute for Animal Diseases, Mödling, Vienna, for 1935**].—*Bull. Off. internat. Epiz.* **13.** 254-255. 1 table. [1 ref.]

A table is given showing numbers of samples of material sent for diagnosis. Anthrax was diagnosed 89 times, brucellosis 76 times, swine erysipelas 124 times, pasteurellosis in swine 14 times, fowl cholera 136 times, blackleg 524 times and rabies in 23 animals. Numerous tests for glanders all gave negative results. —J. E.

GREAT BRITAIN. (1937). **Twenty-Sixth Report of the Development Commissioners being for the Year ended the 31st March, 1936.** pp. 184. London: H.M. Stat. Off. [8vo] [3s.]

Of the sum of money placed at the disposal of the Commissioners in 1935-1936, £41,300 was expended on veterinary research institutions by annually recurring or special grants, and £43,770 in animal genetics, animal nutrition, dairy research, poultry research and animal breeding. The veterinary institutions were :- The Institute of Animal Pathology, Cambridge University; the Research Institute of the Royal Veterinary College, London; the Veterinary Laboratory of the Ministry of Agriculture, Weybridge; the Foot-and-Mouth Disease Research Committee, and the Animal Diseases Research Association of Scotland. In each case, a short note is given on the number and grading of the staff and the sum granted.

The Agricultural Research Council decided to establish a Field Station mainly for the purpose of providing better facilities for the study of animal disease. £43,000 was sanctioned by the Commissioners to enable this project to be carried out.

For the first time since 1931 a considerable sum was approved for the erection of new buildings at Institutes engaged in research or agricultural education, *e.g.* University College of North Wales, Bangor, £2,000 (for extensions involving Veterinary Department), and Royal (Dick) Veterinary College, Edinburgh (£20,000).

The investigations in progress at the institutions supported by the grants from the Development Fund are described in reports issued by the Departments and reviewed in the reports of the Agricultural Research Council.

Two studentships for research in animal health were awarded.—J. C. W.

GREAT BRITAIN. (1936). **On the State of the Public Health. Annual Report of the Chief Medical Officer of the Ministry of Health for the Year 1935.** [MACNALTY, A. S.] pp. iv + 238. Numerous tables, 2 graphs, 1 map. London: H.M. Stat. Off. [8vo] [3s. 6d.]

LEPTOSPIROSIS (WEIL'S DISEASE).—This is primarily a disease of rats, but cases have been described in foxes and in dogs: in hunting packs the disease is known as " yellows ".

RAT BITE FEVER.—This disease is usually conveyed to man by the bite of an infected rat, but cases have occurred following the bite of the dog, cat, kitten, ferret, squirrel, pig and bandicoot.

PSITTACOSIS.—The following is of interest :- " In the spring and autumn of 1935 consignments of parakeets arrived from Australia and in each of seven different consignments psittacosis was found among the birds. In each instance birds had died during the voyage, and whenever this occurs suspicion must arise that psittacosis is the cause of the mortality ".

CANCER.—General reference is made to the research work in progress on the causation of cancer.

MILK (SPECIAL DESIGNATIONS) ORDER, 1923 AND 1936.—The number of producers' licences for " Certified " and Grade A (T.T.) milk in force at the end of 1935 was 814 in England and 151 in Wales, a net increase of 217 and 49 respectively over the corresponding figures for 1934. The increases are partly attributed to the exemption of this milk from the operation of the Milk Marketing Scheme. Administrative points dealt with include inspections carried out before licences are issued and official tuberculin tests.

Changes introduced by the Milk (Special Designations) Order, 1936, are mentioned. Detailed records of tuberculin tests of dairy herds licensed by the Ministry are kept in London. About 370 veterinary practitioners have been approved by the Ministry of Health for making tests, and more reliable results have been obtained since the synthetic medium tuberculin has been adopted. In 1935 the presence of tubercle bacilli was reported nine times in supplies of designated milk from tuberculin-tested herds, seven herds being involved. Five tuberculous cows were found in four of the herds, but none in the other five.

Following the investigations of WILSON [*V. B.* **6.** 541.] on the bacteriological grading of milk, a modified methylene blue reduction test supersedes the plate count test for raw graded milks. An enquiry was carried out on the supervision and control of pasteurizing plants [*V. B.* **5.** 649].

Two outbreaks of scarlet fever due to milk are discussed. In both cases the milk had become infected with *Streptococcus haemolyticus* from milkers suffering from sore throat. An outbreak of staphylococcal food poisoning from infected milk is recorded.

UNDULANT FEVER.—The survey of undulant fever infection was continued. Thirty-three cases were traced but, since notification of cases is often obtained even years after their occurrence, it is considered that there were many more cases than this during the year. A number of the patients were consumers of special grades of raw milk designated under the Milk (Special Designations) Order, 1923.

MEAT INSPECTION.—There is brief reference to this subject, emphasis being laid on the unevenness of the meat inspection throughout the country.

FOOD POISONING.—Included in a general account of this condition is information concerning food poisoning from ducks' eggs and food poisoning from beef of an infected animal. When slaughtered it is considered that the animal was almost certainly infected with a salmonella septicaemia. The carcass was not noticeably unhealthy but from all parts of it examined *S. typhi-murium* (*aertrycke*) was isolated and 174 cases, 8 of which were fatal, developed as the result of eating material from this animal. In other outbreaks considered to be related to meat there was no evidence concerning bacteriological infection of animals from which it was derived. Duck eggs were suspected on strong circumstantial evidence to be the cause of 10 outbreaks of food poisoning, but it was not possible to trace the infection. In all but 2 of the 10 instances, eggs of foreign origin were implicated.

RABIES VACCINE.—22,360 c.c. of antirabic vaccine were issued by the Ministry's Pathological Laboratory.—J. C. WALLACE.

I. GREAT BRITAIN. (1935). **Annual Report for Year ending 31st July, 1934. The National Institute for Research in Dairying, University of Reading.** [KAY, H. D.] pp. 77. 12 tables, 1 photograph. Reading: Nat. Inst. Res. Dairying. [4to].

II. GREAT BRITAIN. (1936). **Annual Report for Year ending 30th September**

**1935. The National Institute for Research in Dairying, University of Reading.** [KAY, H. D.] pp. 66. 6 tables. Reading: Nat. Inst. Res. Dairying. [4to].

I. No reactors were disclosed at the tuberculin tests carried out in October, 1933, and April, 1934, on the herd producing " Grade A (T.T.) " milk. Contagious abortion was still present.

The Department of Bacteriology continued work on the viability of bovine tubercle bacilli. Experiments on the Vernes test for the diagnosis of tuberculosis in dairy cattle indicated that the test does not differentiate between the sera of normal and infected cattle. Research work was carried out on pasteurization, including the value of a *Bact. coli* test for the efficiency of pasteurization and on the " keeping quality " of milk, both raw and pasteurized.

Short notes are also given on the blood composition of dairy cows, on the hormonal control of lactation, on phosphatase in the serum and udder of cows and on the phosphatase test for heated milk.

Summaries of published papers are given.

II. The report consists of two sections; the first deals with changes in staff, appointments, progress during the year, contagious abortion in the Institute herd and the financial position, and the second gives the reports of the various departments.

The health of the institute herd remained excellent except for the presence of contagious abortion. No reactors were found at the October, 1934, tuberculin test but at the official test carried out under the Ministry of Agriculture Attested Herd Scheme in February, 1935, there were two reactors (a two-year-old heifer and a calf).

The Bacteriological Department studied the performance of types of apparatus for high-temperature, short-time pasteurization. This department also has statistical evidence which shows that not less than two g. pigs should be used in animal inoculation tests for the presence of bovine tubercle bacilli. Under Market Milk Investigations the coliform organisms in pasteurized milk, keeping quality and bacterial count of raw graded milk, and the phosphatase test were dealt with.

—J. C. WALLACE.

## BOOK REVIEWS.

MALKUS, B. [Prof. der Pathologie und Direktor der medizinischen Klinik an der Tierarztlichen Hochschule in Hannover], & OPPERMANN, T. [Edited by]. (1937). Grundriess der klinischen Diagnostik der inneren Krankheiten der Haustiere. **[Clinical Diagnosis of Internal Diseases of Domestic Animals].** pp. vii + 277. 75 text figs., 18 figs. on 1 plate, 1 table. Leipzig: Max Janecke. [12th Edit.] [8vo].

The 12th edition really differs hardly at all from the 11th of 1933. The whole book has been revised, chiefly by the addition of short paragraphs of new matter which fill in gaps existing before in discussions of the diagnosis of diseases of the various body systems.

The book remains a very useful guide and reminder to workers in clinics and in general practice in European countries situated in the temperate zone.

—J. E.

MILKS, H. J. [D.V.M., Prof. Therapeutics and Director of Small Animals Clinic, New York State Veterinary College], & EICHHORN, A. [D.V.S., Director of the Veterinary Department, Lederle Antitoxin Laboratories]. (1937).

**Practical Veterinary Pharmacology, Materia Medica and Therapeutics.** pp. xiii + 581. 28 text figs., 4 figs. on 3 plates. London: Baillière, Tindall & Cox. [3rd Edit.] [8vo] [$6].

This book is made up of 30 chapters varying in length from 2 to 70 pages. The first seven chapters deal briefly with matters such as pharmacy, dispensing, and prescription writing. The chapter on pharmacy extends to 29 pages and includes long lists of various pharmaceutical products; under tinctures a list of 40 is given.

In the main part of the book no particular plan is followed. Five chapters deal with drugs acting on particular systems; that dealing with the digestive system includes bitters, emetics, purgatives and also anthelmintics. Nine chapters deal with drugs having particular actions, including antipyretics, diuretics and counter-irritants. In seven chapters particular groups of drugs are considered, including volatile oils, acids, and halogens, and one chapter headed "Miscellaneous" includes insulin, sugars, malt and maggots. This method of dealing with the subject has resulted in a certain amount of repetition. The last chapter, headed "Biological Therapeutics," deals with the control of conditions such as anthrax, bovine contagious abortion, dog distemper, fowl pox, and also with the tuberculin and mallein tests.

In what may be termed the "materia medica matter" in the book very comprehensive lists of agents are given; for example the group of hypnotics contains a list of twelve. All pharmaceutical preparations mentioned are, of course, of the U.S.P. or the N.F. and, therefore, differ from preparations of the B.P. or B.P.C.

Pharmacology is dealt with at considerable length and in some cases this does not make for clearness. In the case of physostigmine, pilocarpine, and arecoline, for example, although they are grouped together under the heading of peripheral nerve stimulants, the actions of each are dealt with in detail as if the three drugs differed essentially in their actions.

In some cases too, statements are made the meaning of which is obscure and in other instances the descriptions of actions do not accord with those given in other up-to-date text-books.

In the parts dealing with therapeutics a large number of prescriptions are given; the index of prescriptions contains about 250. In addition to the fact that the inclusion of prescriptions is of doubtful value, several of those included are not good examples of prescriptions as such.

The proofs of the book have been carelessly corrected as printers' errors are present in considerable numbers.—W. J. Ironside.

Schmidt, H., & Peter, F. M. (1937). Ergebnisse und Fortschritte der Antimontherapie. [**Results and Progress in Antimony Therapy**]. pp. 218. 8 figs., numerous tables. [Numerous refs.] Leipzig: Georg Thieme. [8vo] [RM.15.50].

Up to about 30 years ago the use of antimony in clinical work had practically been given up, but the discovery of the trypanocidal activity of tartar emetic initiated a new chapter in the use of antimony compounds. Tartar emetic has to a great extent been replaced by various trivalent and pentavalent organic compounds of antimony. Research on the clinical use of these substances is still very actively proceeding and new compounds are still being introduced. The present book gives an account of the results obtained up to date and discusses critically the large number of data on the various uses of antimony compounds in human and veterinary medicine. Special attention is paid to compounds which have been

recently introduced, *e.g.*, stibilase and tristibine in use since 1935, and some more recent ones are discussed in an appendix. The indications for the various trivalent and pentavalent derivatives are described in detail, together with the dosage and method of administration, and the variations in effective dosage obtained by different observers with some of the drugs are also discussed. The methods of preparation and chemical properties of some of the compounds are described in a short chapter and their pharmacological properties, as investigated experimentally and clinically, are also dealt with separately. The book can be thoroughly recommended to anyone interested in the clinical application of the new antimony compounds. The absence of an index is, however, to be deplored.—J. M. ROBSON.

SIMONNET, H. [Professeur à l'Ecole Nationale vétérinaire d'Alfort]. (1937). L'hormone folliculaire. **[Follicular Hormone]**. pp. xi + 531. 23 figs., 6 tables. [Numerous refs.] Paris : Masson et Cie. [4to] [Fr.100].

S. has produced a thorough and comprehensive review of the voluminous literature on the chemistry, physiology and pathology of the oestrus-producing ovarian hormone which is known by various names – follicular hormone, oestrin, oestradiol or dihydro-oestrone. He was one of the pioneers in the experimental and clinical study of this hormone and has dealt with some 2,500 references, including many personal documents.

The first three parts deal with the nature and origin of the hormone and its physiological actions. S. considers dihydro-oestrone to be the true ovarian hormone and allied substances like theelin (ketohydroxy-oestrone), oestriol (trihydroxy oestrone), etc., to be elimination forms.

The physiological actions of follicular hormone on both male and female organisms are fully dealt with and the mode of action discussed.

The part played by follicular hormone in pathology is next dealt with, especially its role in pubertal, menstrual and climacteric troubles and its bearing on sterility. The suggestive chemical similarity between follicular hormone and cancer-producing substances is discussed, and S. considers that the hormone is not the determining factor in the development of cancer though it may play a part in favouring the evolution of tumours by its action on the tissues. He deals also with the possible role of follicular hormone in male pathology, *e.g.*, in enlargement of the prostate gland.

In the final part of his review S. deals with the uses of follicular hormone in therapeutics, *e.g.*, in deficient ovarian secretion, menstrual disorders, nervous disturbances of the menopause, etc.

The review is exhaustive, well-compiled and well reproduced.—A. ROBERTSON.

ESCANDE, P. [Docteur Vétérinaire. Président Honoraire du Syndicat des Vétérinaires de Seine-et-Marne]. (1937). Les premiers pas du vétérinaire. **[First Step for the Veterinary Practitioner]**. pp. 120 + 32. Paris : Vigot Frères. [8vo].

This is a book of counsel from an old practitioner to young graduates starting practice and includes general advice on professional work in its ethical and business aspects as well as from the technical point of view.—J.E.

ANON. (1937). **Supplementary Catalogue of British Medical Films of Technical Interest to Medical Practitioners and Students, Jan. 1936 – Jan. 1937.** pp. 16. London : British Film Institute. [8vo] [6d.]

This supplement contains the titles of 13 veterinary films made at the Royal Veterinary College, London. They are mostly on surgical subjects. The main catalogue was noticed in *V. B.* **6.** 914.—J. E.